Learn to:

• Navigate through the health IT interoperability maze
• Exchange patient information with trusted partners

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Intersystems®

Anita Samarth
IHE USA is a 501.c.3 not for profit public charity founded in 2010. Its vision is to improve the quality, value, and safety of healthcare by enabling rapid, scalable, and secure access to health information at the point of care. IHE USA operates as a national deployment committee of IHE International® in order to advance its mission to improve U.S. healthcare by promoting the adoption and use of IHE and other world-class standards, tools, and services for interoperability. IHE USA engages all levels of public and private sector participants to test, implement, and use standards-based solutions for all health information needs.

Find out more at www.iheusa.org.
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Introduction

Interoperability can be a daunting concept for any industry. In healthcare, it’s even more complex, given the number of stakeholders: patients, doctors, nurses, staff, hospitals, nursing homes, payors, and vendors. The list goes on and on. To top it off, healthcare stakeholders are used to living in their own silos, with information tailored only for them.

For years, hospitals and other health provider organizations have stitched together systems with interfaces. For nearly ten years, the healthcare industry has been discussing the need and vision for interoperability of health information. But a lot of healthcare organizations — and even IT solutions for healthcare — have been predicated on supporting information silos. So, the health information industry has been in a mindset that drove the need for integration via interfaces instead of interoperability. But the old way of “stitching it together” doesn’t work anymore. Enter interoperability.

What does interoperability really mean for you? This book was written to help explain exactly that. Health information integration and interoperability aren’t just for IT departments, CIOs, and informatics people anymore. Clinicians, patients, consumers, and payors all need to know that the right people are getting access to the right information at the right time in the right place in the right way. Maybe we could start a “Five Rights for Healthcare Interoperability” movement!

About This Book

I’m hoping you can use this book to help think through where and how you (or your colleagues) should be involved in supporting the health information exchange and interoperability needs within your organization. Along the way, I show you how Integrating the Healthcare Enterprise (IHE) can support you in achieving interoperability. IHE drives the adoption of standards for healthcare by publishing guides for how to use...
those standards — and testing to ensure systems comply with those guides. IHE is a worldwide organization that supports interoperable healthcare to improve quality, ensure patient safety, and reduce costs.

If you’ve done research on healthcare interoperability standards and specifications without some guidance on where to start and how to navigate the articles, websites, and Wiki sites, you may have quickly found yourself lost amid technical jargon, lots of acronyms, and specifications that make you feel like you need a degree in informatics or computer engineering.

You can find plenty of information about interoperability on the Internet, but it comes from a lot of different sources. It can be hard to sift through the various perspectives, to figure out the real story, or to find the best place to get started. IHE facilitates a consensus and standards-based approach to interoperability. The technical details are available on IHE’s website; there are also educational webinars and presentations to help you on your interoperability journey. I wrote this book in collaboration with IHE to provide readers with a foundation for understanding IHE and its role in advancing interoperability. IHE also seeks to provide a guide for readers to participate in interoperability efforts and leverage IHE capabilities in their organizations.

I hope this book helps demystify approaches for sharing information such as clinical documents and helps orient you to some basic IHE interoperability terms and specifications.

**Icons Used in This Book**

This book makes use of some standard *For Dummies* icons — those little illustrations in the margins of the book meant to draw your attention to the text next to them.

- **This bull’s-eye symbol signifies a great tip to focus your attention on.**
- **This icon serves as a friendly reminder about an important bit of information to keep in mind as you consider your interoperability needs and requirements.**

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Chapter 1
IHE 101

In This Chapter
▶ Understanding the benefits of IHE
▶ Looking at the IHE process
▶ Introducing IHE Profiles
▶ Finding where IHE is in place
▶ Understanding Meaningful Use
▶ Seeing a few IHE examples
▶ Examining IHE domains

You may have heard people mention IHE when they’re talking about electronic health records (EHRs), health information exchanges (HIEs), or health IT in general. Contrary to popular belief, IHE isn’t a single standard or even a set of standards. It’s a nonprofit organization that brings together all types of stakeholders in healthcare and health IT to coordinate sharing of health information. The goal is to improve the quality, value, and safety of healthcare by getting everyone to use the same standards in the same way when exchanging information, also known as interoperability.

Known formally as Integrating the Healthcare Enterprise (IHE), IHE International was started in 1997 to promote health IT interoperability. And although it’s a nonprofit organization, IHE is also a shorthand way to refer to the set of standards and specifications it recommends. It’s also a multistakeholder interoperability community. IHE USA was formed in 2010 as a national deployment committee of IHE International, and is one of many regional or national deployment committees around the globe.
Seeing How IHE Can Help

IHE improves patient care by providing a common standards-based framework for seamlessly exchanging health information among care providers at a local, regional, or national level. More than 160 health IT vendors have implemented and tested products worldwide based on IHE.

Whether you’re a provider in a private practice, a specialist, or you work in a larger healthcare system, IHE can play a huge role in streamlining your clinical workflow. Anytime you want to coordinate with another provider, healthcare institution, processing center for clinical samples, or a public health agency, IHE can make your life easier. Implementing health IT is complicated enough. Looking for vendors and products that support IHE is a good first step to selecting a system that will support your interoperability needs. The information you need is easily stored, transferred, and incorporated into your existing technology without manual data entry or trying to figure out whom the information belongs to. IHE offers interoperability that cuts across specialties, healthcare settings, and different kinds of technology. If you’ve worried about getting stuck in a technology silo, IHE is just the right framework to support you.

IHE helps you achieve the following benefits:

- Safety through the reduction of medical errors
- Savings through lower implementation costs and more efficient workflow
- Satisfaction through better informed medical decisions and timely presentation of up-to-date clinical information

Examining the IHE Process

IHE fills an important gap between the development of health IT standards and their implementation in real-world health IT systems. IHE convenes experts worldwide in 13 clinical and operational domains to develop guides for the use of established standards to make health IT systems interoperable and achieve effective use of EHRs.
To help develop these guides, called *IHE Profiles*, IHE members (over 500 organizations) create a story or *use case* that describes how health information might need to be shared in the real world. The members also make decisions on how the information should be packaged and shared so that everyone does it the same way (*technical specifications*).

An IHE Profile (see the following section for more), describes in detail how to use common messaging, content, and terminology standards such as HL7, DICOM, and LOINC. All the IHE Profiles taken together make up a *standards-based framework* for health information sharing. Healthcare technology companies use these IHE Technical Frameworks to address information sharing within critical areas in healthcare settings.

Every year, IHE hosts events called Connectathons and participates in public demonstrations like the HIMSS Interoperability Showcases, where health IT vendors can get together and test and demonstrate their IHE Profiles with other companies to show how they’re able to share health information in the real world.

The major steps in the IHE process are:

1. **Problem Identification**: Clinicians and IT experts work together to identify common interoperability problems with information access, clinical workflow, administration, and the underlying infrastructure. IHE addresses integration needs within departments and clinical domains, as well as across organizational and enterprise boundaries.

2. **Profile Specification**: IHE participants define and document common integration requirements and identify the relevant standards. The approach in how to address the problem by applying standards is documented in the form of an IHE Profile. All IHE documents are subjected to public review to ensure the broadest possible consensus. And they are freely available for download on the IHE website at [www.ihe.net](http://www.ihe.net).

3. **Connectathon Testing**: The IHE Profiles become the basis of an open call for vendor participation in the testing process. Participating vendors test their
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systems with a suite of software tools at annual IHE Connectathons — face-to-face with other vendors’ systems. This allows the vendors to assess the maturity and accuracy of their implementation and resolve issues of interoperability in a neutral, supervised testing environment. (For more on Connectathons see Chapter 3.)

4. Integration Statements for RFPs: Vendors publish IHE Integration Statements to document the IHE Profiles supported by their products. Referencing the appropriate IHE Profiles in Requests for Proposals (RFPs) can greatly simplify the systems acquisition process for hospitals, health systems, and health information organizations.

Vendors publish IHE Integration Statements as a form of attestation that their products support IHE profiles. These integration statements can be helpful to distinguish capabilities between different products. IHE USA is taking that one step further with the IHE USA Certification program. Products labeled as IHE USA Certified are independently tested and certified in order to further aid health IT decision makers and assure purchasers that the vendor or developer has integrated select IHE Profiles correctly. (For more on IHE USA Certification see Chapter 3.)

Introducing IHE Profiles

An IHE Profile is aimed at solving a particular need or problem from the perspective of the user (the person using the health IT software). Some profiles depend on each other, so a software system may comply with several profiles.

Each domain’s technical framework brings together all the IHE Profiles for that domain and describes how they can be implemented together in the real world. It describes overall workflows of information sharing, where each IHE Profile makes its appearance, and how it works with all the others. The frameworks generally are broken up into three parts:

✔ Profiles: Gives an overview of each profile in the domain, describing the use case and a conceptual view of how the profile addresses it.
 Transactions: Describes in thorough detail the protocols used for exchange of information in each profile.

 Content Modules: Defines the data in any documents to be exchanged in each profile.

A technical framework document runs to several hundred pages, so if you’re not a software developer, this probably isn’t the best place for you to start. If you’re trying to learn more or determine what profiles you want your health IT system to support, check out the brief profile summaries each domain maintains on the IHE Wiki (http://wiki.ihe.net/index.php?title=Profiles). Then talk with health IT vendors to learn about how they implement IHE and what capabilities they can offer your organization.

Seeing IHE at Work

Chances are, if you’re in the U.S. and have an EHR system certified for Meaningful Use, you’re already using technology that employs an IHE Profile. For example, most nurses and physicians electronically receive patient laboratory results through an EHR. If the EHR system is certified for Meaningful Use then it may use parts of the IHE Laboratory Technical Framework (for example), which makes sure that laboratory results can be received by the EHR system and displayed for the provider.

The EHR vendor community is constantly working on becoming more interoperable and looking to IHE to help them do it, which means that IHE is incorporated into more and more parts of healthcare technology. But some healthcare systems and EHR vendors are more involved with IHE than others. Check out Chapter 2 to see how some healthcare systems are getting the most out of IHE and Chapter 3 to learn more about IHE USA Certified products.

IHE is working all around you, but if you want to get the inside scoop on the best IHE has to offer, you can check out the IHE success stories, which focus on implementation of the IHE Radiology Technical Framework. If you’re a vendor or system developer, you may want to take part in a Connectathon; if you’re a health IT leader in your organization, you might want to attend the Connectathon Conference that’s held during the event. You can also stop by an Interoperability Showcase at a HIMSS Conference to see vendors that are implementing IHE.
Profiles and watch health IT function on more than just paper. Vendors can only demonstrate systems using IHE Profiles at a HIMSS Conference if their systems have passed testing at an IHE Connectathon within the previous 12 months (see the earlier section “Examining the IHE Process”).

**Using IHE in Your Organization**

Most healthcare organizations and providers are overwhelmed with just keeping up with the day-to-day challenges of EHR adoption and optimization. You may feel that the national and regional initiatives already on your plate (such as healthcare reform, changing reimbursement and payment models, Meaningful Use, Patient-Centered Medical Home (PCMH), and ICD-10 planning) are enough to use up any available people or technology resources.

But you’re embarking on all these difficult initiatives to improve care delivery and efficiency. Improving quality without increasing access to information is just plain impossible. And you can’t access health information for your patients without interoperability. IHE aligns with many of the initiatives you’re already working on. In this section, I examine some of the current health IT initiatives that may already be on your roadmap and explain how IHE fits in and supports them.

**Implementing an EHR system certified for Meaningful Use in the U. S.**

If you’ve purchased an EHR system certified for Meaningful Use, there are certain things you need to be aware of. Meaningful Use Certification requires EHR technology to address interoperability and some EHRs employ IHE to meet requirements around exchanging lab orders and results or using patient summaries in a standardized way. But there is more to Meaningful Use than interoperability, and there is much more to IHE than just Meaningful Use!

2014 Edition EHR Certification (which is the version needed to support providers in achieving Stage 2 of Meaningful Use) includes IHE capabilities and profiles as options to meet
interoperability certification requirements. In addition, many individuals who participate in IHE also participate in the Office of the National Coordinator for Health IT’s Standards and Interoperability (S&I) Framework initiatives, so there are a number of requirements that are complementary to or build on IHE.

IHE supports sharing health information in new and exciting areas that Meaningful Use hasn’t addressed yet. For example, IHE also deals with mobile health and medical device interoperability with an EHR system. Meaningful Use sets baseline or minimum requirements — there is always room to aim for higher levels of interoperability and IHE can help you achieve that.

Check with your EHR vendor about which IHE Profiles they use in their software applications. Make sure you have access to these capabilities in your EHR system, and know how to use them. See if the IHE Profiles supported by your EHR system allow you to link up with other health systems or health IT infrastructures in your area. Read up on some of the IHE domains in the “Introducing the IHE Domains” section to find out how you might be able to make the most out of the IHE Profiles already in your EHR. Chapter 2 explores some approaches where IHE can support exchanging information between EHR systems.

Key components of Stage 2 of Meaningful Use, as well as the trajectory for Stage 3, include the exchange of documents with third parties. As an organization with an EHR certified for Meaningful Use, consider how you will be exchanging information with third parties:

- Will you be focusing on point-to-point exchange?
- Will you be integrating with an intermediary at a local, regional, or state level such as a health information exchange (HIE) vendor or Health Information Service Provider (HISP)?
- Does your organization plan to exchange information with other health information organizations or communities?

As you answer each of these questions, the next natural question is how this will be accomplished. IHE capabilities for patient identity management, document exchange, and privacy/security can play important roles in supporting these
integration scenarios. See Chapter 2 to learn more about IHE capabilities to support various approaches for health information exchange. And see Chapter 3 to find out how IHE USA Certification may be able to provide you with greater assurance that specific products and versions will have the IHE capabilities you’re looking for.

**Participating or contracting for local/state/regional health information exchange**

Now that all this health information is starting to be captured electronically, everyone wants access to it! Hospitals and health systems are developing organizational health information exchanges (HIEs) to integrate information across inpatient, ambulatory, and specialty care settings. Local, regional, and state exchanges are popping up all over the globe. IHE is a very important component of integrating this information from disparate systems in an interoperable manner. Remember in the old days when you had to develop point-to-point HL7 interfaces with each system? Or possibly you had to have a whole team of interface engine programmers direct HL7 transactions to each system according to the way each vendor specified it?

You may already be using IHE Profiles to support information exchange. Or, your EHR or HIE technology infrastructure may be exchanging information using HL7-based messaging interfaces. There are implications to the interoperability scenarios your EHR or HIE technology may be able to support depending on the integration approach and IHE specifications that have been implemented.

Ask the vendors you work with how patient identifying information is exchanged and matched. Has an enterprise master patient index (EMPI) been implemented? Is information exchanged via messaging or via IHE patient identity management profiles? (More on this in Chapter 2.)

Working with health IT solutions that support IHE Profiles can reduce the technology and integration burden of onboarding new data sharing partners and sharing of additional clinical content or document types.
Contracting with an analytics vendor

In the previous section, I describe the role of IHE in an HIE. Once the information is accessible via an HIE (or within your EHR), you’re going to want to analyze it to help you make decisions. It’s important to understand the context of information that may be comingle, aggregated, or summarized across different care settings and systems.

Historically, data warehouses, reporting platforms, and other tools in healthcare used messaging-based protocols to create copies of information contained in transaction-based systems, such as EHRs, to be available for reporting and analytics. As electronic information and standards are evolving, HIE and analytics vendors have begun to build the capability to integrate data from multiple systems to provide a more longitudinal view of patient health information. Vendors are starting to implement IHE Profiles and document exchange standards that are prevalent in EHRs to increase the alignment of analytics and EHR information. Also, analytics vendors are seeking ways to leverage interoperability and IHE Profiles to support the integration of clinical and administrative data from disparate sources, including EHRs, laboratories, imaging providers, pharmacies, payors, and so on.

If your EHR information is interfaced using messaging standards, updates to the interfaces will be required to expand the content and capabilities of the exchanged information. For example, as EHR vendors are implementing standards-based exchange protocols in support of Meaningful Use Stages 2 and 3, work with your analytics partner to ensure that this information can be consumed and leveraged for reporting and population health management.

Looking for an EHR/HIE/analytics vendor

If you’re looking for a vendor, figure out what you want and make sure you get everything you need from your EHR, HIE, and analytics vendors to ensure seamless interoperability. Ask a lot of questions and research what kinds of IHE Profiles that
you want supported in your health IT system. This publication will give you a better idea about where IHE can be incorporated into your clinical workflow and point you to where you need to go to learn more and make the important decisions.

**Introducing the IHE Domains**

You're probably thinking that this all sounds pretty great, but how does IHE actually fit into a health system's workflow? IHE is organized into clinical and operational domains that outline how IHE is implemented in the real world for each of these areas. Each domain has a technical committee that maintains Technical Framework documents to meet the domain’s interoperability goals.

The following is a quick introduction to several IHE Domains with links where you can find more information on any of the domains that are interesting to you.

- **Cardiology:** The Cardiology domain (http://ihe.net/Cardiology/index.cfm) covers clinical workflow and information sharing for seven main cardiac profiles including Echocardiography, Stress Testing, and Displayable Reports. These profiles cover all aspects of a clinical process — from ordering a procedure to image viewing and storage across providers and institutions.

- **Dental:** The IHE Dental domain (http://wiki.ihe.net/index.php?title=Dental) manages the newly developed IHE Dental Technical Framework and the IHE Dental Profiles. At the time of publication, the IHE Dental Planning and Technical Committees are creating a Secure Exchange of Dental Information (SEDI) work plan to guide the development of IHE Dental Profiles. These profiles will be tested for the first time at the 2014 North American Connectathon. IHE continues to expand to new domains like Dental. Keep checking them out for new developments and areas in need of standardization.

- **Eye Care:** The Eye Care domain (http://ihe.net/Eyecare/committees/index.cfm) focuses on integrating patient eye care information and workflow throughout healthcare facilities including scheduling, eye evaluation, image exchange, and diagnostic reporting.
IT Infrastructure: The IHE IT Infrastructure domain (http://ihe.net/IT_infra/committees/index.cfm) is one of the most comprehensive. It describes how health IT can do some of the most basic and important functions, such as mapping different patient records to the same patient or making sure that all of the clocks on a system are on the same time. It also supports more complicated systems like storage and sharing of electronic health record documents.

IHE Profiles to support document sharing and exchange (covered in Chapter 2) are part of the IT Infrastructure Domain.

Laboratory: The Laboratory domain (http://ihe.net/Laboratory/index.cfm) outlines the way diagnostic laboratory information should be captured and shared from start to finish. It outlines tasks such as a provider ordering a lab test, to the lab performing the test, and through the final report of the lab results back to the provider. But don’t be fooled by that simple scenario — this domain is extensive in its profiles: It includes specifications for laboratory information sharing in many other settings including point-of-care and patient bedside, integration of laboratory equipment, and sharing of lab tests between laboratories.

Patient Care Coordination: The Patient Care Coordination domain (http://ihe.net/pcc/committees/index.cfm) covers sharing of patient information among different providers throughout the patient’s lifespan or across different health problems in different specialty areas. It covers sharing health information documents like Discharge Summaries, Emergency Department Referrals, and Personal Health Records. To learn more about the Patient Care Coordination domain and the individual profiles it encompasses, read Chapter 2.

Patient Care Devices: The Patient Care Devices domain (http://ihe.net/pcd/index.cfm) deals with how medical devices communicate with other healthcare technology — primarily focusing on sending health information from the point-of-care to the EHR to keep patients safe and improve their quality of care. Devices can send information about anything: from measurements to alarm conditions, vital signs, or medication administration. And IHE Profiles eliminate manual data entry steps.
Quality, Research, and Public Health: The Quality, Research, and Public Health domain (or QRPH; see http://ihe.net/qrph/index.cfm) makes it possible to do more with health IT, including clinical research, public health surveillance, and improvement of patient outcomes. If every doctor and hospital reported clinical information differently, no one would be able to make any sense of all the data combined together. For example the IHE QRPH domain makes it possible for the CDC to monitor cancer rates or for a research group to determine whether a drug is really working like it’s supposed to.

Radiology: The IHE Radiology domain (http://ihe.net/Radiology/index.cfm) is one of the first IHE domains — formed in 1998. It covers everything from ordering and scheduling to storing and viewing radiology images. IHE Profiles are well-established in many PACS, RIS, and enterprise imaging solutions and platforms.

Mobile access to health documents

In 2012, IHE introduced a new profile to support mobile access to health documents (IHE-MHD). This profile is designed to simplify delivery of documents to a mobile device from a personal health record (PHR), EHR, or HIE by providing an implementation guide for using an application programming interface (API) based on web resources. As mobile devices emerge as the platform for health information, this profile supports scenarios such as:

- Using a medical device to submit data in the form of documents.
- Using kiosks, tablets, or other devices to collect information during patient registration — where a staff member will review, edit, or approve the information before it is stored within the hospital or practice system.
- Transmitting information from a PHR to an intermediary or staging area before it’s transmitted to or imported into an EHR or HIE.
- Enabling a patient or provider application to securely connect to a PHR to submit information, such as a medical history.
- Enabling a physician practice without an EHR to connect to an EHR or HIE using a mobile device.
Chapter 2

Using IHE to Exchange Documents and Coordinate Care

In This Chapter
▶ Examining clinical scenarios for exchanging documents
▶ Exchanging documents versus clinical messaging
▶ Identifying patients
▶ Identifying and contacting providers
▶ Communicating information securely and privately

As more clinical information is captured and managed electronically, it should be easier to exchange, right? Nothing’s that easy, but that’s where IHE is able to help. In this chapter, I get you started in considering the document sharing scenarios that may apply to your organization and introduce you to the support that IHE can provide along the way.

Assessing the Current State of Information Exchange

One common sentiment among patients and healthcare consumers when talking about interoperability is one of bewilderment. “You mean this information isn’t integrated already?” In the age of targeted marketing, targeted online retailers, and
Google analytics, many people are surprised to discover that doctors and nurses don’t have access to needed information at the point of care.

Even hospitals that have just a single EHR vendor have a lot of other systems to integrate with. And many of these “single vendor solutions” aren’t built on a single database platform or architecture — vendors sometimes acquire other vendors, which means there’s back-end integration necessary to offer those solutions as “integrated” using a single name.

To put things in perspective, take a look at the way things work in a paper-based world. If a primary care provider wants to send a referral summary to a specialist, the doctor (or office staff) must identify and look up the patient, find the patient’s paper chart, identify the information needed for the referral, determine the historical information to include, look up the specialist’s contact information, and then fax the information over. And the provider still doesn’t know if the fax went through until there’s a confirmation. Then there are questions like: Did the right person pick it up off the fax machine, determine if the patient is new or an existing patient in the specialist’s practice, find or create the patient’s chart, and file it correctly?

In a digital world, all these steps still occur, albeit electronically. IHE provides the specifications and framework for these functions to be standards-based and interoperable.

**Looking at document sharing communities**

Health information for patients is stored in many places. Many provider facilities have healthcare documents of use to other providers and organizations — documents that can help coordinate care among certain providers. These are often referred to as health document sharing communities. Here are some of these communities:

- Organizations that are geographically focused, such as regional health systems
- Organizations that focus on a particular patient population, such as the Veterans Administration
- Health systems and integrated delivery networks

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Single hospitals
- Ancillary service providers such as laboratories, radiology providers, or therapies
- Organizational/local/regional/state health information organizations or exchanges

The scope of health information and documents shared in these communities often varies. Some may share a limited set of information (such as summary records or lab results) and others may be more extensive.

Comparing interfaces and integration: Messaging versus documents

From a workflow perspective, much clinical information is captured in the form of clinical documents — whether paper or electronic. For example, orders, nursing assessments, nursing flowsheets, consult notes, diagnostic reports, history and physicals, discharge summaries, and encounter notes are all persistent documents that are complete at a point in time. However, in a messaging-based world, information is more of a snapshot at a given point in time.

In discussing interoperability for document sharing, it’s helpful to understand the difference between a document and a message. HL7 makes this distinction: a document is designed to be persistent, whereas messages are transient — they’re information as it is at the moment of transmission.

IHE defines document sharing as follows:

- **Persistence:** Documents are persistent over time. The content of the document doesn’t change from one moment to another. A document represents information stored at a single instance in time. A hospital discharge summary and a referral request are two examples of persistent documents.
- **Wholeness:** A document is a whole unit of information. Parts of the document may be created or edited separately or may also be authenticated or legally authenticated, but the entire document is still to be treated as a...
whole unit. A dictated note that has been transcribed is a whole document and so is an EHR encounter note that has been signed by a provider.

✓ **Stewardship:** A custodian, either an organization or a person entrusted with its care, maintains a document over its lifetime. This is likely the organization that the provider is working for or contracted with at the time when the document is created. The hospital or practice is responsible for retaining the information — be it on paper or within IT systems — and owns the legal medical record.

✓ **Context:** A clinical document establishes the default context for its contents. The context is clear about when the document was generated, for what purpose, and its contributors of information. For instance, the contexts of a history and physical or an office visit encounter note are known and understood.

✓ **Potential for authentication:** A clinical document is an assemblage of information that can be legally authenticated. This means that the document has an official and legal role as a stand-alone piece of information.

### Introducing the IHE Domain for Document Sharing

The IHE domain that focuses on document sharing is called the IHE IT Infrastructure domain. Yes, that’s a mouthful, so it’s referred to as IHE ITI for short. This operational domain addresses the implementation of standards-based interoperability solutions to improve information sharing, workflow, and patient care.

### Explaining the ability of IHE Profiles to better coordinate care

Many patients are seen in multiple care settings and it’s up to each healthcare system to share health documents with other providers for a given patient to ensure a smooth transition from one care setting to the next. For this to happen, all care settings must have a consistent format for exchanging electronic documents (so you know the exact medication...
and dose of a prescription, or that the first name and the last name of the patient are in the right location). But who decides what the format should be and where you keep the information?

There are terminology standards and document standards already developed, but how should you implement them? Standards Development Organizations (SDOs) such as HL7, the National Council on Prescription Drug Programs (NCPDP), DICOM, IHTSDO, and LOINC to name a few — do a lot of heavy lifting. However, standards enable interoperability only when they’re used in a consistent manner. This is where IHE helps by taking the standards a step further. IHE ties standards to a use case or specific problem and works collaboratively with SDOs to develop implementation guidance.

For supporting care coordination via document exchange, IHE has identified a few specific use cases related to identifying and managing patients, identifying and communicating information with providers, and communicating information among different types of document-sharing communities in a secure way. These use cases are called IHE Profiles and they give health systems that coordinate patient care a consistent format, process, and workflow so they can share electronic health documents easily and often (for more on IHE Profiles, see Chapter 1).

**Introducing metadata:**
**Data about data**

*Metadata* refers to descriptive data about data. It’s a very important part of interoperability for document sharing because it helps describe the information that’s contained in the interoperable document or transaction. Metadata is extremely valuable and IHE uses a common metadata model across all its profiles. Metadata defines important aspects of the documents including identifiers of the document, association with a patient, where the document was created, and so on.

Metadata supports the document and aids the sender/receiver of the document by establishing its identity, enabling discovery and routing, authenticity, and enabling electronic preprocessing of a document. All these things enable interoperability when the metadata is always coded in the same way — exactly the same set of metadata is provided every time. Then the receiving
Interoperability For Dummies, IHE Edition

system can, in an interoperable way, manage, route, and administer a document without having to look at the patient-sensitive health information inside. In fact, the receiving system may not be able to interpret the content of the document. For example, if a document is in PDF, it would take a human to review the document; but because of metadata, a computer/system is able to manage the document because it knows what the document is, although not what’s contained in it. This enables health systems to exchange information readily while maintaining patient privacy, so the document can be routed by anyone, but only the appropriate care providers see the patient’s actual health information.

**Identifying patients**

In the healthcare environment, you may need to identify a patient within a health system or across IT systems within a hospital, or you may need to identify patients across organizations.

Health systems accomplish this in many ways. A unique identifier can help, but the same unique identifier isn’t usually implemented across different systems or organizations. You can search using some demographic information such as name, date of birth, sex, and so on. IHE is designed to be flexible — an exact method of patient identification isn’t specified, however, it offers a number of profiles to support patient identity management in an interoperable way so that documents can be exchanged for the right patient.

Every document is associated with a patient who is identified either by a patient identifier or demographic information. Documents reside in a number of different places, and if an organization is looking for a document for a patient, you need to include enough demographic information with your document for the receiving organization to match it to the patient. It can be challenging to know what demographic information to send. Some organizations create a commonly known patient identifier prior to providing patient documents to simplify this process.

Even if your health system uses a single-vendor solution, there are still many specialty systems from multiple vendors within a typical healthcare delivery system. Each vendor system typically has its own method and identifier for identifying patients.
There are two key profiles available in IHE for patient identity management: PIX and PDQ. I’ve managed to limit the use of acronyms so far, so don’t fret — it’s actually quite simple! PIX is pronounced like “pics” and refers to the IHE Profile for Patient Identifier Cross-Referencing. PDQ is pronounced by spelling out the letters, P-D-Q, and stands for Patient Demographics Query.

Identity management can be accomplished by pushing data from the sender to the recipient, or by having the receiver query for and pull the data from the source or sender.

**PIX: Linking across multiple patient identifiers**

In a hospital, there may be multiple sources of patient registration information (also referred to as Admit-Discharge-Transfer information, or ADT) for different entry points of the patient into the healthcare delivery system.

Multiple patient identifiers can be linked using a single system within the organization that uses the same patient identifier. In this model, the transmission of a source feed from a system (for instance emergency department versus hospital registration versus labor and delivery admitting) is sent to a manager service (PIX Manager). Individual or departmental systems will have the ability to query the PIX Manager — the PIX Manager will store the various identities for the patient and in response to the query will provide the appropriate identity for the patient.

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**Relationship to eMPI**

If your organization has already implemented an enterprise master patient index (eMPI) solution — either to integrate patient information within the organization or in conjunction with data sharing partners as part of a health information exchange, there are still important roles for the IHE PIX capability to link information across multiple patient identifiers. IHE PIX is designed to be compatible with eMPI solutions. eMPis identify patients through demographic matching based on information from within the organization, or in conjunction with data sharing partners as part of an HIE. PIX doesn’t replace an eMPI, but can use the eMPI as one of its source feeds to the PIX Manager, which manages the various patient identities in different source systems.
For example, a laboratory system in a hospital may be used to track and process both inpatient and ambulatory care specimens. The lab system itself has its own patient-identifying capabilities and is set up to have signing authority with the PIX Manager. The hospital’s main patient registration system has its own signing authority. The PIX Manager allows both systems to cross-reference the laboratory and patient registration system. Any other authorized systems can also query the PIX Manager to identify the patient.

**PDQ: Querying for a patient using demographics**

If a single, central system to manage patient identities isn’t available, how do you match patient information across two health records? You look up information based on demographics, right? The IHE Patient Demographics Query (PDQ) Profile does just that — in a standard way. IHE PDQ provides a very simple means for enquiring to receive demographic information, based on:

- Partial or complete patient name
- Patient ID (this may be obtained from a printed barcode or a bedside chart)
- Partial ID entry or scan
- Date of birth/age range
- Room/Bed ID

IHE PDQ may be used, for example, when a patient is admitted to the hospital from the ER and assigned to a bed. Assume that this patient is in and out of consciousness and wasn’t admitted with any identifying information. The nurse knows his first name and that the patient just came from the ER. The nurse enters patient identity information into the tracking system for bedside monitoring to establish the relationship of the assigned bed to the patient. The application issues a query for a patient pick list to a hospital system with demographic information (the patient registration system for example). This system provides data for a patient pick list from the quick registration performed in the ER. The nurse is able to assess the patient’s age range and has his first name, so using that demographic information, the system returns a list of patients showing the Patient ID, full name, age, sex, room/bed, and admit date, displaying the list to the nurse.
The nurse then selects the appropriate health record to enter the patient identity information into the tracking system for bedside monitoring.

Not all demographic attributes for a patient are typically known. IHE PDQ supports demographic attributes that include: Identifier List, Patient Name, Date/Time of Birth, Sex, Patient Address, Patient Account Number, Patient Class, Attending Doctor, Referring Doctor, Consulting Doctor, Hospital Service, Admitting Doctor, Visit Number, and Assigned Patient Location.

But how does this work when you’re trying to locate information for a patient that you’re seeing for the first time? If you have an EHR system that supports the IHE Profile for Cross-Community Patient Discovery (that’s IHE XCPD), your EHR can discover patients outside your community. So, if you’re with a provider organization that is either part of an HIE that supports this capability or your EHR system supports it, you can look up information in another EHR system or HIE using the patient identifiers (demographic information) you have at hand.

**Identifying and contacting providers or data sharing partners**

How do you locate a provider in order to exchange documents? This is strongly influenced by governance and policy because the needs vary across environments and organizations. IHE has developed building blocks that can enable different approaches to identifying and locating a provider or an organization to exchange documents with. There are multiple approaches to identifying providers.

If provider information is centrally managed, an organization knows who its sharing partners are. For example, a hospital may have a listing of its community and referring physicians within its systems. This information may include contact information such as fax numbers, electronic communications information, or office phone numbers. Creating this listing within the hospital likely requires some sort of process for verifying the information and updating the system — either by manual data entry or managing a configuration file. Any time there’s a new provider or existing provider information changes, the system needs to be updated manually with the new information.
There are also regional and national service registries where any participant can query and find provider information. Some state medical societies offer this service, and there are a number of national provider credentialing and registry services available that manage information across state boundaries.

IHE supports an emerging approach where an electronic directory of healthcare providers maintains the complex collection of relationships between providers and helps find electronic services that are available from those providers. This is called a provider directory. This approach can be extremely useful when you’re looking for a data sharing partner who may have seen your patient before. For example, your patient indicates that she was seen in the ER last week and you wish to access the information from that visit. If your organization has a data sharing relationship with the hospital or ER, the provider directory can be used to access contact information that enables secure and trusted communication with that provider. Another use case supports the ability of an ER provider to search for an endocrinologist for a patient who is Spanish speaking, for example.

The IHE Healthcare Provider Directory (IHE HPD) Profile supports queries against, and management of, healthcare provider contact information that may be publicly shared in a directory structure. HPD supports both individual providers and organizational providers and classifies them by provider type, specialty, credentials, demographics, and service locations.

Looking at Models and Use Cases for Finding and Sharing Documents

So how do you find useful documents about your patients? And how do you gain access to them? IHE has identified three models for document sharing:

- **Direct push:** This type of sharing is also called point-to-point push. It means one participant has the content, knows exactly where it needs to go, and sends it to the recipient. Direct push works when you know the organization or person that you’re sharing information with.
For instance, if Dr. Jones knows that he’s referring his patient to Dr. Kerns, and has her contact information, he can directly push a referral summary document to Dr. Kerns via secure e-mail. Dr. Kerns or her office staff will manually access the document and decide whether to store it within Dr. Kerns’ local EHR. Secure e-mail exchange is one approach for point-to-point communication of documents.

The Cross-Enterprise Document Media Interchange Profile (IHE XDM) supports sending the information directly from Dr. Jones to Dr. Kerns when there is no networked connection between them. It’s a simple approach to package and exchange information without a networked connection. This approach takes the metadata and document and essentially creates a Zip file for exchange via secure e-mail or burning to physical media such as a USB or CD. XDM requires human intervention on the receiving end to decide what to do with the document: manually identify or import the data with the correct patient identifiers. This approach can also be combined with secure protocols for communications such as the Direct specification.

In IHE XDR, which is the profile for Cross-Enterprise Document Reliable Media Interchange, the content is sent through a reliable system using web services from the sender to the receiver. IHE XDR is essentially a profile that extends the IHE XDM Profile to work between enterprises and organizations versus within one.

**Centralized discovery and retrieve:** In this model, there’s a common set of technical infrastructure that is used by the entire data sharing community. So the documents or links to the documents are stored centrally. When Dr. Jones wants to share information with Dr. Kerns in this model, Dr. Jones may not need to send anything at all. This is because Dr. Kerns can access the clinical documents generated by Dr. Jones. If Dr. Kerns wants to, she is able to store a copy of Dr. Jones’ referral summary within her local EHR. Using this model, finding your data sharing partner isn’t that difficult, because there’s a common, centralized infrastructure in place. The IHE Profile that supports this model is referred to as Cross-Enterprise Document Sharing, and is abbreviated as IHE XDS (see Figure 2-1). In this model, document sources that have documents will push either metadata about the document or metadata with the document into the record locator service.
Federated discovery and retrieve: In this model, content is directly pulled from a content holder. Say Dr. Kerns receives a patient that she knows was seen by Dr. Jones, but also knows that her patient just moved from another city and is wondering if there is any other relevant information available on her patient. She has a system that can query for “Do you have any information on my patient?” In this case, results are provided when there are results for that query. This model requires a method for finding the sharing partners to query. Because Dr. Kerns knows the area her patient moved from, she’s able to query the appropriate data sharing community in her patient’s former city. The Cross-Community Access Profile (IHE XCA) supports this model for document exchange.

Communicating Information Securely and Privately

So how do you make sure patient information is secure and in line with patient privacy protections? Sharing information among data sharing partners involves a significant amount of policy-setting. That can be harder than the technical part. IHE
is policy agnostic. This means that the IHE Profiles are designed to support multiple policy and governance models — and there are no specific privacy or security policies that must be in place to use IHE. But IHE does address security and privacy in the healthcare enterprise and in many cases allows you to implement robust options that go beyond the minimum requirements around privacy and security such as those in the U.S. for Meaningful Use.

IHE provides guidance and education on policy considerations as part of its educational information. IHE published a white paper on Enabling Document Sharing Using IHE Profiles to introduce you to policy considerations. You can find it at www.ihe.net/Enabling.cfm.

Although IHE doesn’t set policies, it is policy sensitive. This means that there are a variety of IHE security and privacy profiles that are important to consider when sharing documents. IHE Profiles use the following security and privacy controls:

- **Privacy and security audit logging:** Supports the generation of an audit that can be used to generate reports and alerts.
- **User and system identification and authentication:** Supports the determination of whether users are valid and are who they say they are.
- **Data access:** Supports the ability to only allow authorized access to data. This is often managed in health IT systems by role-based access controls.
- **Secrecy:** Supports the protection of health information (via encryption, access controls) so it can only be viewed or used by those who are able to decrypt the information.
- **Data integrity:** Supports the protection of the stored or exchanged information itself. This control ensures that information hasn’t been corrupted, modified, or tampered with.
- **Nonrepudiation:** Supports the tracking and capture of who did what and when. For example, if a physician orders a test, the test is associated with the physician who ordered it — and this can’t be changed or refuted with this control.
Privacy consent management: Supports patient-specific instructions for handling patient health information.

Availability: Ensures that information is available when needed. Includes the ability to implement back-up and recovery systems and controls that support reliability, such as interruptible power supplies or high-availability storage infrastructure that supports the ability for data that’s needed fast to be available quickly.

Learning More About IHE Document Sharing

IHE has many resources available in regard to document sharing. You will likely not need every capability discussed in this chapter. When working with vendors, seek to understand their approaches to interoperability. Ask them which profiles they support for document sharing. Then check the IHE website to verify that the vendor has successfully tested the capability at a Connectathon or if relevant to your region, whether they have attained IHE USA Certification. (Find out more about Connectathons and IHE USA Certification in Chapter 3.)

Resources from IHE (including white papers and webinars) in support of document sharing are available at www.ihe.net/ITI.
Chapter 3

Seeing IHE in Action

In This Chapter
▶ Involving healthcare professionals
▶ Attending IHE Connectathons and HIMSS Interoperability Showcase
▶ Looking at the Health Story Project and the HIMSS Innovation Center
▶ Understanding the IHE USA Certification Program
▶ Participating in IHE
▶ Exploring the role of IHE in public policy

IHE isn’t just the set of guides and specifications the process yields. It’s a multistakeholder interoperability community. This means that you can see it in action and get involved! IHE is at the center of interoperability efforts in healthcare. This chapter tells you more about where and how you can see IHE in action.

Getting Involved as a Healthcare Professional

If you’re a CMO, CIO, clinician, or project manager, you may be wondering if IHE is for you. “Isn’t IHE just for techies and standards folks?!” No, it’s not — there are many ways to get involved and clinician, leadership, and implementer input is very critical.
Hopefully this publication can help you learn about the importance of integration and interoperability in healthcare and how IHE use cases support clinical and workflow outcomes. IHE has participants at all levels and backgrounds; you just have to find the right group. It is very important to have real-world input into the IHE process. IHE needs to know where interoperability is or isn’t working for you — and they want to ensure that the profiles address your challenges appropriately.

There are a number of IHE workgroups and committees for healthcare leaders and providers. Participating in these groups helps ensure that the marketplace is addressing your needs and that the IHE Profiles you include in the RFP stages of system acquisition are useful to you. Review options to participate at www.ihe.net/Participation/index.cfm.

**eNursing Summary**

A lot of attention is currently focused on the importance of care coordination and transitions of care. A number of interoperability efforts support exchange of summary documents and provider notes across care settings. However, critical information in patient care plans is often not communicated across care settings. IHE initiated a survey to look into exchange of care plan and nursing summary information and found that 62 percent of EHRs couldn’t export this information. Meanwhile, 90 percent of nurses agreed that this information should be shared across care settings and health systems. The IHE Patient Plan of Care (PPOC) and eNursing Summary (eNS) profiles support the capability to exchange patient data for improved coordination of care and “hand-offs” between care providers.

**Participating in IHE Connectathons**

For those health IT vendors and developers who have demonstrated commitment to delivering interoperability and integrating IHE Profiles in their products, the IHE Connectathons offer a great opportunity to test out their systems and ensure that information can be shared with other systems that leverage IHE.
These events happen every year in Australia, Europe, Japan, and the U.S. And some have started up in China and Korea too. Over 150 vendors and 600 engineers and IT architects participate in the annual North American Connectathon alone.

IHE brings together large numbers of vendors in a neutral setting that provides a highly structured and supervised process that not only allows for testing, but also monitors, tests, and reports who passes. Connectathon testing is supported by technical managers and monitor volunteers who oversee the testing process and make sure vendors are testing their systems, and not reporting unvalidated results. Passing Connectathons is important for vendors — it’s one of the only ways they can test profiles in development and the interoperability of their systems against a wide variety of systems, including their competitors.

The best thing about Connectathons is they allow vendors to make changes and updates to their software code in real time — meaning that they can troubleshoot any problems they discover and fix them right away. Plus, hundreds of expert IHE implementers are onsite, often willing to lend a hand. So a vendor can head to a Connectathon thinking that all its software is completely interoperable, find out it’s not, figure out where the problem is, fix it, pass the Connectathon, and be successfully interoperable with different health IT vendor systems by the time they leave the one-week testing event. That’s quite a week!

If you’re interested in learning more about IHE, consider attending the Connectathon Conference. You’ll get an overview of what IHE is all about and even get a guided tour of the Connectathon testing floor in action. For more information, visit www.iheusa.org.

Getting into the HIMSS Interoperability Showcase

As you probably know, HIMSS is the biggest health IT professional organization and holds the largest annual health IT conference in the industry. HIMSS also hosts Interoperability Showcases at its global events. These demonstrations give vendors the opportunity to show the advances they’re making in information sharing.
Next time you’re at a HIMSS conference, take a Use Case-focused Tour at the Interoperability Showcase. It guides you through a *continuum of care* using clinically relevant scenarios — such as how a patient’s health information might travel from an Ambulatory Provider to a Hospital, Emergency Department, Chronic Care Facility, or Public Health agency. For more information, visit [www.interoperabilityshowcase.org](http://www.interoperabilityshowcase.org).

**Understanding the Health Story Project**

The Health Story Project was created by an alliance of healthcare vendors, providers, and associations to accelerate and promote comprehensive electronic clinical records that tell a patient’s complete health story. The Health Story Project has accelerated the development of HL7 Clinical Document Architecture (CDA) implementation guides for common types of clinical documents, and shepherded the adoption of these implementation guides in the industry. The Project’s main goal is to help health IT gain the ability to tell the complete health story of a patient. It does this by promoting standards in recording health information (instead of keeping it locked in unstructured documents, like transcribed files). Health Story works to accelerate the integration of narrative notes into the EHR through use of standards.

IHE plays an important role as a participant in the Health Story Project. IHE worked with the Health Story Project, HL7, and the Office of the National Coordinator for Health IT Standards and Interoperability Framework (ONC S&I Framework) to spearhead much of the consolidation and harmonization effort for clinical document standards that are now part of the next stage of Meaningful Use and EHR Certification.

In 2013, IHE and the Health Story Project teamed up to test Consolidated Clinical Document Architecture (C-CDA) interoperability at the North American Connectathon and demonstrate C-CDA capabilities at the HIMSS13 Interoperability Showcase. To learn more about the Health Story Project, visit [www.healthstory.com](http://www.healthstory.com).
Examining the HIMSS Innovation Center

HIMSS recently announced that it will take over the entire fourth floor of the Global Center for Health Innovation in Cleveland, Ohio, to launch the HIMSS Innovation Center. The Center will provide an environment dynamic enough to prove the achievement of the next wave of increasingly sophisticated requirements for the secure, electronic exchange of health information. The Center will leverage simulated patient demographic, clinical, and financial information to allow health IT system providers to test their interoperability capabilities. The Center may become the epicenter for health IT testing — particularly for software that supports health devices that you can carry around with you (mobile health) and ones that monitor patients when they’re not in the hospital (remote monitoring technology). Once the Center is complete (anticipated in fall 2013), it will be a great place to witness IHE in action on all levels year-round!

Introducing the IHE USA Certification Program

Certification is an approach used in many industries — a seal of approval for a technology solution that provides consumers additional confidence. In 2013, IHE USA partnered with ICSA Labs to launch a new certification program, separate and distinct from, but complementary to, Meaningful Use EHR certification. The program was first piloted at the 2013 North American Connectathon. Ten different IHE Profiles were piloted based on relevancy to the U.S. market and vendor readiness. They included CT, ATNA, XDS.b, PIX, PDQ, PCD-DEC, PCD-PIV, and XCA.

The IHE USA Certification Program focuses specifically on higher level interoperability requirements relevant to the U.S. market and products featuring integrated IHE Profiles that complement or surpass interoperability specifications for Meaningful Use. The ICSA Labs testing and certification framework is guided by internationally accepted ISO standards.
standards and enhanced by the lab’s experience administering the Health IT Certification Program for Meaningful Use in the U.S.

The healthcare industry is placing increasing emphasis on shared information, quality, and accountable care. The IHE USA Certified mark provides independent third-party assurance that products have been tested to meet selected IHE Profiles, going beyond vendor-generated attestation. Certification also safeguards purchasers by ensuring that certified technologies in the market are monitored to perform as tested over time.

Benefits of IHE USA Certification include:

✓ Certification testing is performed by specially trained testing analysts.

✓ Certification testing is comprised of a combination of documentation review, testing to a number of industry-approved test tools familiar to Connectathon participants, and peer-to-peer testing against disparate systems to validate interoperability.

✓ “Scenario Testing” is included to better model end-to-end interoperability among participating products and to add additional rigor beyond Connectathon testing.

✓ Products that have attained certification are monitored to ensure that they remain in compliance in order to maintain their certification.

✓ Certification is granted only to the specific products and versions of software tested.

How does IHE USA Certification raise the bar?

The topic of Meaningful Use has dominated the healthcare industry since the U.S. government stepped in to offer billions of dollars in incentives for hospitals and providers that implement certified health IT. Although IHE USA Certification isn’t directly tied to the EHR adoption incentives, IHE USA Certified products support Meaningful Use objectives by going beyond the baseline requirements. See Chapter 1 for some basic information about Meaningful Use.
Learn more about the certification program at www.icsalabs.com/technology-program/ihe-usa-certification.

Currently over 3,000 EHR products are certified for Meaningful Use. Verifying Meaningful Use certification is a helpful first step when procuring a system, but there are still so many solutions to pick from. IHE USA Certification is aimed at further distinguishing products that can achieve interoperability that surpasses Stage 1 and Stage 2 requirements for Meaningful Use — with an eye on Stage 3 and beyond. The IHE USA certification program will also help expand the available certified products to include Health Information Exchange (HIE) products, Patient Care Device (PCD) manufacturers, and other participants in the health IT continuum.

**Participating in the IHE Community**

If you’re thinking that you or your organization might have some expertise that would be valuable to IHE, consider getting involved with the community. There are lots of ways you can participate.

**IHE Committees**

IHE manages its work through a structure of planned and coordinated committees. Each IHE Domain has a Planning and Technical Committee that consists of experts from the healthcare professions and the health IT industry. Each committee sets short- and long-term goals for its domain and manages its IHE Technical Framework. The Domain Planning Committee focuses on determining the priorities and defining the scope of its work. The Domain Technical Committee is responsible for writing the technical framework documents that deal with all the details of the domain specifications. Other IHE groups include the Testing and Tools Committee, the Marketing and Communications Committee, and the IHE International Board.
Membership

IHE International is made up of more than 500 member organizations that work to improve interoperability of healthcare technology. Member organizations can sponsor representatives in Domain Committees and National/Regional Deployment Committees such as the IHE USA.

Public comment

IHE values input from all healthcare stakeholders. Each domain’s technical framework documents and supplements are released for public comment prior to final publication. Current technical frameworks are available on www.ihe.net.

Workshops and webinars

IHE hosts educational workshops to educate vendor representatives, public health experts, consultants, and healthcare providers on making the most of the IHE initiative. IHE also offers online webinars and presentations in virtual formats. Check the IHE website for information on upcoming workshops and other educational presentations.

Aligning IHE and Public Policy

The healthcare industry in general is often described as being ten years behind other industries in terms of automation, integration, and standards. You may have heard the banking, ATM, or credit card analogies where many ask, “Why can’t we do that with our health information?” Now these are bigger questions than I can answer in this short publication, but all the attention on healthcare over the last few years has placed an increased focus at both the policy level and practice level for organizations to interoperate and leverage technology to improve quality and efficiency, while reducing costs.
Public policy in healthcare is also pushing for innovative ways and tools to appropriately use health information. With the availability of web-based, cloud-based, and mobile platforms, expectations are high among health information consumers, payors, and policymakers to have health information easily available.

The healthcare community has been advocating strongly for standards for years — and with the vast amount of information that is available for exchange, the need is even greater today. IHE provides the community and framework for convening, organizing, and documenting specifications for interoperability. IHE has been in place since 1997 as a multi-stakeholder, multivendor industry initiative solely focused on healthcare interoperability. IHE has a proven role with its initial focus in radiology and today has many of its specifications in use by EHR and HIE vendors and their customers.

IHE is at the center and core of other standards and interoperability efforts supporting healthcare, such as the Health Story Project, ONC’s S&I Framework, eHealth Exchange, and other activities that have contributed to, and guided, Meaningful Use requirements. However, it’s important to realize that IHE’s reach and scope is much broader than Meaningful Use and it fosters standards adoption in many domains across the globe. (Refer back to Chapter 1 to learn more about the various IHE domains.)

By participating and recommending IHE Profiles in public policy efforts for interoperability, you can leverage the experience of real-world testing and implementations to drive the effective use of health IT to improve quality and reduce costs.
Ten Benefits of Using IHE

In This Chapter

▶ Examining the benefits of IHE

This chapter goes over the many benefits of using IHE. There are hundreds of standards for health information exchange, written to support a wide range of clinical and operational processes that include many optional features. But standards don’t accomplish much in the way of interoperability if every health IT system implements them differently. IHE creates profiles of relevant standards for supporting a particular clinical task throughout the industry. IHE does this by specifying the information that must be exchanged between systems, and specifying what systems must do with the information that is received. IHE doesn’t specify clinical workflow, define user-interfaces, or guide usability — it provides the framework that EHR systems, HIEs, devices, and other electronic systems can use to exchange health information. IHE is here to help.

Benefits for Patients

IHE strives to foster and promote interoperability to benefit patients. Secure, interoperable health IT systems help reduce medical errors. Such systems also facilitate the availability of information so that providers and patients can make informed decisions about healthcare.

In the U.S. healthcare system, patients see lots of doctors and care providers in many different settings. Plus, there are many healthcare decisions and actions patients take away from the doctor’s office or hospital — such as medications taken at home, exercising, or engaging in healthy (or unhealthy) behaviors. IHE supports interoperability efforts
that enable patients to communicate with their providers and access information that their providers document. This helps patients to be informed partners in their health status.

So whether it’s ensuring that the right information is exchanged for the right patient at the right time for optimal delivery of care, or enabling patient access to health information using a PHR, or communicating information from a mobile application or in-home device to a care coordinator, or just getting rid of the darn clipboard that requires filling in the same information every single visit, IHE is working to improve care and access to information for patients.

**Benefits for Hospitals and Health Systems**

In the Introduction to this book, I mention creating a “Five Rights for Healthcare Interoperability” movement. Using IHE supports the proper flow of information from one system to another, thereby putting the right information in front of the right clinician at the right moment to assure the right treatment. Using IHE helps hospitals and health systems ensure that this right information can be accessible by the right system regardless of location — on the patient care floors, in the operating room, in the emergency department, or securely on a physician’s mobile device when outside of the hospital.

IHE supports breaking down silos and sharing information across systems to integrate information contained within an organization and across organizations. Hospitals and health systems that use IHE can reduce their dependence on interfaces, which are costly to develop and maintain. Demanding that your legacy or new health IT systems leverage IHE Profiles for coordinated care and document exchange can help set you on a path to reducing point-to-point or custom interfaces. Include IHE requirements as a part of your Request for Proposal (RFP) process when acquiring new technologies.

**Benefits for Ambulatory Practices**

Although many of the benefits to hospitals and health systems apply to the ambulatory setting as well, there are unique
information exchange needs. Whether you’re a solo doctor in a primary care practice, a specialist in a multispecialty group, or a nurse practitioner in a retail clinic, you sometimes need to refer your patients to other ambulatory providers, the emergency department, or hospital. And after a patient has been in those other care settings, you may still have to manage or monitor the patient’s care.

As described in Chapter 2, IHE provides the interoperability framework to support referral and transition of care workflows. Using ambulatory EHR solutions that conform to IHE Profiles will help reduce the cost and workflow burden of exchanging information with other practices and hospitals. Looking for products that have attained IHE USA Certification, as discussed in Chapter 3, is another way to identify technologies that have been verified to support selected IHE Profiles.

**Benefits for Clinicians and Care Providers**

Efficient and seamless access to standards-based clinical information is important to support informed medical decisions. EHR and health IT systems are continuously improving and innovating. The use of standards facilitates use of clinical decision support capabilities, which are often triggered based on structured and coded information such as the problem list, medication list, allergy list, or lab results.

IHE provides the foundation for clinicians to have a complete view of a patient’s “story” regardless of where the patient has presented for care. Thus, there’s no more searching for the discharge summary from the hospital while the patient is in your waiting room, or hoping the abnormal lab result report that was faxed to your office was received and picked up off the fax machine.

IHE Profiles are predicated on the concept that information exchange must occur securely and privately so you can be confident that your health IT systems can access the information needed to appropriately manage your patients’ health information.
Benefits for Federal Health Providers

Interoperability is a hot topic in the Department of Defense (DoD) and Veterans Administration (VA). The DoD and VA have elected to continue to implement their own EHR strategies and systems, but are committed to interoperability efforts between the departments, and beyond — with national exchanges and other healthcare systems and providers. The same patient identity management and clinical document exchange challenges that IHE supports in the commercial health sector are relevant to the VA and military health.

Benefits for Federal Agencies

The U.S. federal government is the nation’s largest payor for healthcare via Medicare and other programs. Leveraging health information technology has been a focus of the last decade in particular — with many federal agencies focused on research and evaluation of health IT. A National Coordinator for Health IT was created in 2004, through an Executive Order, and the Office of the National Coordinator for Health Information Technology (ONC) was legislatively mandated in 2009. As federal initiatives identify problems and facilitate solutions, IHE plays a complementary and foundational role at the center of achieving healthcare interoperability.

Benefits for State and Local Governments

State and local governments play important roles in monitoring public health. Given all the business, technical, and policy complexities for information sharing and exchange across disparate systems and stakeholders, it’s not surprising that most health information exchange efforts are initiated regionally. As part of the HITECH Act, each state received funding to build infrastructure and building blocks for health information exchange.

One of the key goals of state-level funding is to support state-level policies and infrastructure for information sharing.

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For example, some states have been implementing provider directories — and IHE's Health Provider Directory (IHE HPD) Profile offers a standards-based approach to storing information about healthcare providers and then accessing that information.

IHE efforts have supported public health reporting to the Centers for Disease Control (CDC) and reporting of syndromic surveillance and immunization information. IHE's Domain for Quality, Research, and Public Health (QRPH) includes profiles for vital records management between EHRs and state vital statistics systems, newborn admissions notifications, and public health registry reporting.

**Benefits for Health IT Vendors**

By implementing IHE, vendors can streamline their product development cycles by leveraging this integration capability across multiple customers. Doing so allows staff to focus more attention on creating new product features and functions.

Participation in IHE Connectathons helps vendors to test interoperability with many other vendors using real-world clinical scenarios. And this real-world testing helps vendors bring their capabilities to market faster. Any vendor that says it supports an IHE profile has to prove it — at a Connectathon.

In addition, Meaningful Use raises the bar for EHR interoperability. IHE has created several implementation guidelines and profiles for use by EHR system developers and implementers to support the achievement of Meaningful Use by providers.

Those vendors that want to demonstrate higher levels of interoperability may want to consider IHE USA Certification. Vendors familiar with the Connectathon and IHE will find they’re working with familiar tools and specifications that are scalable, mature, and vetted by the industry.

**Benefits for Monitoring and Mobile Device Manufacturers**

In the past, patient monitoring devices such as ventilators, infusion pumps, and anesthesia machines aptly performed
the function of measuring and indicating patient information. A nurse, physician, anesthesiologist, or other individual looked at the information on the medical device and manually charted the information in the patient’s medical record. So the only information available or accessible for review was the information that was charted for that particular point in time. Today, the integration of medical devices, such as many integrated using profiles from IHE’s Patient Care Devices (IHE PCD) domain, makes measurement information available to health IT systems for review. IHE provides a guide to device manufacturers to communicate device information in a standard way so that the information can be integrated with any health IT or EHR system, eliminating the need for device-to-EHR specific interfaces or the manual data entry of the past.

IHE offers and seeks to develop similar profiles for remote/home health monitoring and mobile devices. The Mobile Access to Health Documents (IHE MHD) Profile defines simple web (HTTP) transactions for exchange of documents using a mobile platform. Participating in IHE Connectathons offers an opportunity for manufacturers and health IT software and technology developers to create rapid prototypes and evaluate priorities for continued IHE integration efforts.

Benefits for Health Information Organizations

Whether your health information exchange is led by a provider organization, regional/state health information organization, or other organization type, the value proposition for health information organizations (HIOs) is changing. HIOs are being formed for more than facilitating document or health information exchange; vendors supporting HIOs are establishing themselves as analytics and population health platforms. HIE vendors now market their solutions as Accountable Care Organization (ACO) platforms. Whether you’re an ACO, state-designated HIE, or health system HIE, access to standardized, reliable information opens up endless possibilities. Implementing HL7 transaction-based interfaces requires close attention and custom support for each participating entity or system. Participating and using IHE — whether you’re an organization, vendor, or health department, will improve your ability to be a value-added service (and information) provider to your stakeholders.
Practical advice for understanding the ins and outs of healthcare interoperability

Healthcare interoperability involves so many standards and acronyms! This helpful book tells you what you need to know about leveraging IHE to improve your organization’s ability to share patient information — securely and efficiently.

- **IHE basics** — find out how IHE can help you meet your interoperability goals
- **Secure document sharing** — examine the current state of document exchange, look at some different scenarios for exchanging information, and find out how IHE is improving the process
- **Get involved** — discover the many opportunities IHE offers for stakeholders and clinicians to work together

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Open the book and find:
- Ten benefits of using IHE
- How to participate in IHE Connectathons
- An introduction to IHE profiles
- The ways providers can exchange information
- Information about the Health Story Project
- An overview of the IHE process
- An introduction to the IHE USA Certification Program

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