PHILIPS

Interoperability Solutions

White paper

# Standards Compliance

# Index

# Philips Interoperability Solutions standards compliance

**Why should I care?**
Whenever you acquire a new (clinical) IT system it will need to connect into your existing IT landscape. The new system may need to bring in information that is stored in other systems or it may need to provide information into these systems to make most use of the individual systems' power. If you do not connect your systems you are effectively creating information silos that prevent your clinical staff from having all the information they need at hand.

When systems are being connected they can work together, i.e. they become interoperable. In a world without standards, each connection you make would require a specific integration project, often with custom development. If you manage an IT environment with many connections, these projects can quickly accumulate in complexity and costs. When systems are interoperable from the start, the amount of work and costs required for connecting them together can be greatly reduced. For systems to be interoperable from the start, interoperability standards are important.

ISO (International Organization for Standardization) defines interoperability as: "The capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units." (ISO/IEC 2382-01, Information Technology Vocabulary, Fundamental Terms).

Think about a wall socket and a power plug: because everyone in a country uses the same specifications, you can buy any device and plug it into a socket in your home and be sure that it works. The device and your wall socket are interoperable. The analogy also shows that standards have a certain reach. If you travel to another country, the power plug standard may be different and you need adapters to make sure you can get your device to work with a different socket. That is, a bit of work and cost is required to connect the systems.

**Applicability of standards**
Given the above, a follow-up question quickly pops up: what standards do the systems need to comply with? Interoperability is required on many levels and for each of these levels, there are standards. Each of those standards comes with its own applicability. Whether a standard applies to your use case(s) requires knowledge and understanding of that standard.

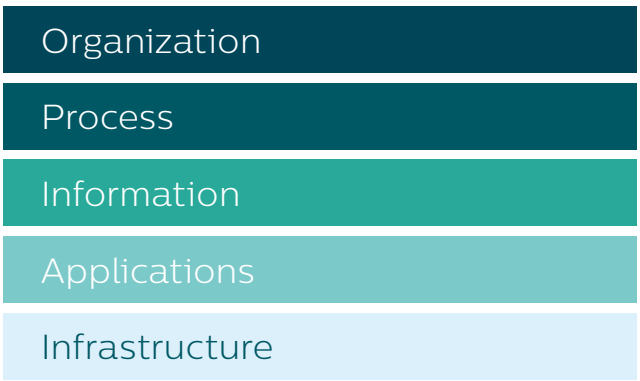
On July 28, 2015, the European Commission identified 27 IHE Profiles as suitable for inclusion in public tenders. See http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:JOL_2015_199_R_0011 and the appendix for the full list of profiles.

# Who wants access to my information?

## Dutch governmental institute for Healthcare IT (NICTIZ) defines five levels of interoperability for healthcare: organization, care processes, information, applications, and infrastructure.

Alignment on each of these levels is needed to reach true interoperability. Resources, care processes, information and applications need to be aligned, and then connected with the infrastructure.

At each of these levels, standards help with implementing interoperability. To make it even more complex: on some levels, multiple standards may exist to solve the same problem. In those cases, it is important to choose a standard based on its merits: maturity, degree of implementation, future readiness, etc. Mature standards have been around for many years, are well described and documented, well tested and implemented, have certified implementations and have a model through which changes are incorporated in future versions. Often, implementation guides help to pick the right standard for a given use case.




### “The nice thing about standards is that you have so many to choose from”

Andrew S. Tanenbaum, Computer Networks.

Healthcare IT systems have traditionally been integrated only on the infrastructure and applications level using peer-to-peer communications. The HL7 version 2 and DICOM standards have been in use to connect systems within the boundaries of healthcare institutions for many years. They have grown into established solutions for system-level peer-to-peer connections in Local Area Networks (LANs) and Virtual Private Networks (VPNs). More recently standards have started to look beyond the boundaries of direct connections and have started to include standardization on other layers such as the care processes and information layers. Standards such as HL7 version 3, IHE XDS (Cross-enterprise Document Sharing) and HL7 FHIR have started to gain traction.

Healthcare standards cover many domains, such as traditional IT Infrastructure topics (e.g. staff management, system security and time synchronization), broader general healthcare topics (e.g. care coordination, care devices, quality management) and specific clinical domains (e.g. radiology, cardiology, and laboratory).

### Implementation guides and IHE

Each of these standards has, to various extents, defined its own scope of use cases, and implementation guides have emerged to provide guidance to users and vendors in the sea of documentation. IHE (or: Integrating the Healthcare Enterprise) has become an established international organization that has identified which standards it views as a best-fit for specific healthcare interoperability scenarios. IHE addresses each one of these scenarios in "Integration Profiles". One of the best-known IHE profiles is Cross-enterprise Document Sharing (or XDS for short) which addresses the interoperability scenario of sharing documents beyond enterprise boundaries.

IHE Integration Profiles are developed in collaboration between healthcare IT users and vendors. Users describe their interoperability challenges in use cases, while vendors create technical guidelines to solve the problems. Integration Profiles are developed in a cycle that is designed to select and deliver mature standards and mature implementations, following an open (ISO accepted) process that takes proposed profiles through public comment and trial implementation stages before becoming accepted. During these stages, early implementers test the usability of the profiles in testing events, called IHE Connectathons. The test results are used both to improve the profiles and the implementations.

Important to recognize in interoperability scenarios is that there is always more than one party involved, IHE refers to these parties as "actors", while HL7 v3 calls them "applications roles". Individual systems comply with one or more actors/roles in an Integration Profile, and not with the Integration Profile as a whole.

### Building a Health Information Exchange on standards

When it comes to establishing a healthcare information exchange (HIE), the above becomes particularly relevant in cases which cross enterprise boundaries and have high IT heterogeneity. There are many aspects to consider, including:

- The IT infrastructure needs to be interoperable.
- Clinical content has to be interoperable, especially when structured information is exchanged and machine-readable, semantic interoperability is important.
- Clinical workflows need to be aligned.
- Patient identity needs to be established.
- Security needs to be aligned.

Health information exchanges of all sizes are built on these considerations. Even though you might not need to think about the individual concepts, knowing that they are behind the solution can help you understand its depth and flexibility and how it can be applied to your environment now and in the future.

Philips has recognized the importance of standardization when building a health information exchange and has designed the Philips Interoperability Platform in line with the principles above. We've built an infrastructure, defined clinical content, added clinical workflow support, dealt with patient identity and have designed for security on every level, and every time we faced the choice of how to implement an interaction we've used standards instead of designing our own solution. In this way, we have made sure that we use accepted and mature principles and can work with your environment where necessary.

**Supported standards**
As there are so many aspects and accompanying standards that need to be addressed when building an HIE, below is a list of IHE Integration Profiles and the respective roles that Philips Interoperability Solutions comply with, grouped by interoperability level. Compliance has been test and validated at IHE Connectathons.

**Infrastructure profiles**
Before information can be exchanged, the infrastructure needs to be established. Philips has implemented the following IHE profiles to create a modular suite of components that can be used to build an HIE infrastructure, whether you select only these components or mix-and-match with other compliant products of your choice

| Integration Profile | Acronym. | Description |
|---|---|---|
| Cross-enterprise Document Sharing | XDS | A blue-print for a patient-centric document sharing infrastructure. Does not describe which types of documents to share, how to address cross-enterprise workflow, staff management, security, patient identity, etc. Additional profiles must be layered on top to address those topics. Philips Interoperability Solutions offer products that cover all roles in this profile, from Document Registry and Repository to Document Source and Document Consumer. |
| Cross Community Access | XCA | A method to connect multiple HIEs together. Where XDS describes using one registry in a single network, XCA allows consumers to lookup information in multiple networks at the same time. Although often combined with XDS exclusively, responding networks do not necessarily have to be implemented using XDS. Philips Interoperability Solutions offer an XCA gateway (both Initiating Gateway and Responding Gateway) product which can connect any XDS network as an XCA community, and its consumer products fully support talking to XCA gateways. |
| Consistent Time | CT | A method to ensure that systems have synchronized time. Philips Interoperability Solutions fully integrate this profile. |
| Document Metadata Subscription | DSUB | Describes a method through which XDS actors can be notified of new document registrations and document updates. Philips Interoperability Solutions support both notifying subscribers of registration events and listening to (and acting on) notifications. |
| Multi-Patient Queries | MPQ | Describes an extension to XDS through which consumers can query across multiple patient records, which isn't covered by the XDS as such. Supported by Philips Interoperability Solutions Document Registry and used by Philips Interoperability Solutions Document Consumer. |
| Mobile Access to Health Documents | MHD | Describes an alternative method to query for and retrieve clinical documents from a server using HTTP REST transactions, which can be easily implemented on mobile devices. Philips Interoperability Solutions include a Document Responder API, meaning external mobile applications can easily leverage the full XDS capabilities of an XDS infrastructure. |

**Clinical content**

With an infrastructure in place, you have the capability to exchange patient-related information between systems, departments, enterprises, regions or even countries. The infrastructure allows for sharing any type of document. But that alone does not create a complete solution; choosing what to share is important, too. If one party shares an MP3 file, for example, while the other party can only process PDF files, there is no interoperability. Philips Interoperability Solutions facilitate the exchange of any type of file and support the following IHE profiles to create interoperability.

| Integration Profile | Acronym. | Description |
|---|---|---|
| Cross-enterprise Document Sharing for Images | XDS-I | A method for sharing clinical images over XDS networks. Uses XDS to register the availability of images in the patient record, while specifying that the images should remain at the source. Images can be retrieved by consumers on-demand using WADO DICOM, WADO JPEG and or DICOM transactions. As with XDS, has undergone a major revision, which is why it is now officially called XDS-I.b. Philips Interoperability Solutions are designed to support the smooth exchange of images. Our platform can make any tractional DICOM system into a fully compliant imagine document source; supports showing image content to uses using XDS-I; and can instruct to deliver images from the network to local DICOM systems. |
| Cross-Community Access for Imaging | XCA-I | Philips Interoperability Solutions also deliver a method for sharing clinical images across XCA networks, supporting bridging requests from regular XDS-I. This goes beyond XCA-I profile, providing support for the DICOM WADO-WS standard to also be able to support delivering JPEG formats across XCA to remain compatible with XDS-I. |
| Portable Data for Imaging | PDI | Describes a method to transfer images on physical media, such as CD/DVDs or USB. Based on DICOM parts 10 to 12. Philips Interoperability Solutions support both the Portable Media Importer role (reading images from PDI compatible media) and the Portable Media Creator role (exporting to a compatible format). |
| Cross-enterprise Sharing of Scanned Documents | XDS-SD | Describes how to encode both plain text and scanned document content in an XDS network. Describes both the XDS metadata requirements and document content formats (CDA-wrapped PDF and plain text). Philips Interoperability Solutions support these documents in the Content Creator and Content Consumer roles. Creation can be manual or automated. Automated creation adapts existing HL7 and DICOM feeds to XDS SD. |
| Cross-enterprise Sharing of Medical Summaries | XDS-MS | Describes how to share medical summaries in an XDS network. Describes both the XDS metadata requirements and content format (CDA). Used in various “transfer of care” scenarios, such as referrals and discharges. We offer solutions for both the Content Creator and Content Consumer roles. XDS-MS Referral Notes have an important role in the clinical workflow scenarios described below. |
| Sharing Laboratory Reports | XD-LAB | Describes how to share laboratory reports in an XDS network, using CDA. Philips Interoperability Solutions support the Content Consumer role. |
| Cardiac Imaging Report Content | CIRC | Specifies the content structure for a clinical report of a cardiology imaging exam, recorded in a DICOM Study. This profile provides an HL7 CDA Implementation Guide for a Cardiac Imaging Report |

| Integration Profile | Acronym. | Description |
|---|---|---|
| Antepartum Education | APE | Describes how to represent the educational material provided during the office visits for the antepartum episode. Philips Interoperability Solutions support the Content Consumer role. |
| Antepartum Health and Physical | APHP | Describes how to share the information that is collected during the first visit of a pregnant patient to an ambulatory office. Philips Interoperability Solutions support the Content Consumer role. |
| Antepartum Summary | APS | Describes how to share a summary of the significant events, diagnoses and plan of care over the course of an antepartum episode. Philips Interoperability Solutions support the Content Consumer role. |
| Antepartum Laboratory | APL | Describes how to share the results of standard laboratory tests administered during an antepartum episode. Philips Interoperability Solutions support the Content Consumer role. |
| Composite Triage and Nursing Note | CTNN | Describes how to document the act of both triage and nursing care delivered to a patient in the emergency department. Philips Interoperability Solutions support the Content Consumer role. |
| Emergency Department Physician Note | EDPN | Describes how to document the care delivered to a patient in the emergency department. The ED physician note is designed to support documentation sufficient to support the transfer of care. Philips Interoperability Solutions support the Content Consumer role. |
| Emergency Department Referral | EDR | Describes how to share critical clinical information when referring a patient to an Emergency Department, using CDA. Philips Interoperability Solutions support both the Content Creator and Content Consumer roles. |
| Healthy Weight | HW | Describes how to share the information needed for managing and monitoring healthy weight. Philips Interoperability Solutions support the Content Consumer role. |
| Labor and Delivery History and Physical | LDHP | Describes how to share the information that is collected during the initial admission to a birthing facility. Philips Interoperability Solutions support the Content Consumer role. |
| Labor and Delivery Summary | LDS | Describes how to share a summary of the data that is often collected during the labor and delivery period at the birthing facility. Philips Interoperability Solutions support the Content Consumer role. |
| Immunization Content | IC | Describes how to share immunization data, using CDA. Philips Interoperability Solutions support both the Content Creator and Content Consumer roles. |
| Newborn Discharge Summary | NDS | Describes how to share a summary of the most critical information to a newborn care provider after discharge from the birthing facility. Philips Interoperability Solutions support the Content Consumer role. |
| Nursing Note | NN | Describes how to document the act of nursing care delivered to a patient in the emergency department. Philips Interoperability Solutions support the Content Consumer role. |
| Patient Plan Of Care | PPOC | Describes how to document an individualized, mutually agreed plan, contributed to by registered nurses. The plan includes problem issues (nursing diagnoses), expected healthcare outcomes, implementable interventions, and evaluation of progress toward outcomes based on follow-up assessment. Philips Interoperability Solutions support the Content Consumer role. |
| Postpartum Visit Summary | PPVS | Describes how to document the summary document that will be used to complete the pregnancy care record. PPVS captures any episode of treatment occurring during the postpartum period. This includes any care a woman receives after she has been discharged from the hospital/birthing facility, up to and including the postpartum visit. The routine postpartum visit, usually occurring six-weeks after birth, completes the obstetric care record. Philips Interoperability Solutions support the Content Consumer role. |

| Integration Profile | Acronym. | Description |
|---|---|---|
| Triage Note | TN | Describes how to document the act of triaging a patient upon presentation to the emergency department. Philips Interoperability Solutions support the Content Consumer role. |
| Exchange Of Personal Health Record Content | XPHR | Describes how to share summaries back and forth between PHRs and healthcare provider information systems, using CDA. Philips Interoperability Solutions support both the Content Creator and Content Consumer roles. |
| Pharmacy Dispense | DIS | Describes how to share a dispense document generated during the process in which a health care professional hands out a medication to a patient. Philips Interoperability Solutions support the Content Consumer role. |
| Pharmacy Prescription | PRE | Describes how to share a prescription document generated during the process in which a health care professional decides that the patient needs medication. Philips Interoperability Solutions support the Content Consumer role. |
| Pharmacy Pharmaceutical Advice | PADV | Describes how to document pharmaceutical advice generated during the process in which a healthcare professional validates a prescription item of a prescription against pharmaceutical knowledge and regulations. |
| Vital Records Death Reporting | VRDR | Describes how to capture and communicate information needed to report a death. Interoperability Solutions support the Content Consumer role. |
| Physician Reporting to Public Health Repository – Cancer Registry | PRPH-Ca | Describes the data elements to be retrieved from the electronic medical record EMR and transmitted to the cancer registry or to a healthcare provider. Interoperability Solutions support the Content Consumer role. |

**Clinical workflow**
Once information interoperability is established, the next focus becomes process interoperability. Often products stop at the information level and leave the process level up to the organization. Philips Interoperability Solutions supports the following IHE profiles to help align and automate these processes as well.

| Integration Profile | Acronym. | Description |
|---|---|---|
| Cross-enterprise Document Workflow | XDW | A blue-print for open workflow management on top of an XDS network. Describes a method through which clinical workflows can be modeled and a method and document format to record the state of individual instances of these flows. In addition, it describes how to record related documents that are input and/or output to workflow steps. Philips Interoperability Solutions support workflows with flexible steps, and can both consume workflow state documents and produce these documents both new and as an advancement of a previous workflow state. Additionally, existing and new documents can be attached to workflow steps. All these steps can be triggered manually through forms or automatically by e.g. HL7 messages. |
| Cross-enterprise Basic eReferral Workflow Definition | XBeR-WD | A workflow definition for electronic referrals, that defines four major steps: referral requested, referral scheduled, referral referred and completed as well as the exception cases. Philips Interoperability Solutions support starting, advancing and closing of XBeR-WD workflows, including attachment of documents to these steps. Both triggered manually or automatically. Philips Interoperability Solutions also supports referral worklists and can also push workflow information, such as new orders, to local systems. |
| Cross-enterprise Tumor Board Workflow Definition | XTB-WD | A workflow definition for tumor board workflows. Defines steps for requesting a discussion, collecting and preparing information for the discussion, documenting the outcomes of the discussion and closing the case. |

**Patient Identity**
A number of patient identity profiles support the infrastructure profiles. Patient identity is an important topic in its own right. Our solutions facilitate patient identity interoperability at every level, with the aim of safeguarding data privacy and integrity.

| Integration Profile | Acronym. | Description |
|---|---|---|
| Patient Demographics Query | PDQ | A method to query for patient demographics, using HL7 version 2. Supported both as Patient Demographics Supplier (in forIndex) and as Patient Demographics Consumer (in forView). |
| Patient Demographics Query HL7v3 | PDQv3 | Same as PDQ, but this time using HL7 version 3. Offers better support for layering other profiles on top, by virtue of using web services, but the HL7 v2 profile is supported by more systems. Also supported both in the Supplier and Consumer roles. |
| Patient Identifier Cross-referencing | PIX | A method to resolve other patient identifiers by which a patient is known. Supported both a Patient Identifier Cross-reference Manager (by forIndex) and as Patient Identifier Cross-reference Consumer (by forView, forConnect, forBridge) |
| Patient Identifier Cross-referencing HL7v3 | PIXv3 | Same as PIX, but this time using HL7 version 3. Offers better support for layering other profiles on top, by virtue of using web services, but the HL7 v2 profile is supported by more systems. Also supported in both the Manager and Consumer roles. |

**Security: Authentication, authorization, and consent**
Another important topic on all interoperability levels is security, which is also a topic in its own right. Amongst others, an HIE needs authentication, authorization, privacy policies and consent. We know that an HIE requires security to be an integrated concept from the bottom up and that security reaches across system boundaries and thus needs to be standardized. Philips Interoperability Solutions include the following IHE profiles to create an interoperable environment that is as secure as possible.

| Integration Profile | Acronym. | What it brings |
|---|---|---|
| Audit Trail and Node Authentication | ATNA | Describes two system level security aspects: secure connections (basically TLS support) and keeping a log of system events. Every single transaction that our interoperability products initiate or accept complies with ATNA. Both for the secure connections as well as for the audit trailing. We also offer an Audit Record Repository product. |
| Cross-enterprise User Assertion | XUA | A method through which back-end systems can communicate user identity in the context of web-service transactions. Allows server applications to perform access control by virtue of trust relationships with clients. Based on the SAML standard for security assertions. Every web-service transaction that our interoperability products initiate or accept includes XUA tokens describing the identity of the requesting/performing user, his/her roles and purpose of use (e.g. for emergency override scenarios). |
| Enterprise User Authentication | EUA | A method through which applications can provide Single Sign-On integration with operating system user accounts. Commonly used when user-facing applications are launched from a browser on a Microsoft Windows desktop. Based on the SPNEGO standard. Also called Integrated Windows Authentication by Microsoft. |
| Basic Patient Privacy Consent | BPPC | Describes both a method and a document format by which patient consent can be recorded, displayed and enforced. Applications record consent in CDA documents, optionally with scanned proof and share this consent in the patient records. Applications that perform access control can take the consent into account in their authorization evaluations. The profile does not describe the actual policies that a patient can opt-in to or opt-out of. This is an effort that individual networks need to address. All clinical transactions in Philips interoperability products are subject to access control, through a policy-based rule engine. Patient consent information stored in the patient record in the BPPC format can be integrated into the decisions and can be enforced. Patient consent can be recorded in various ways, both manually and automatically, including support for patient portal integration. Recorded consent information can also be displayed to users. |
| Personnel White Pages | PWP | A method to discover staff information in a local LDAP (such as Active Directory) server. ForView supports retrieving information from PWP Directories as a PWP Consumer. |
| Healthcare Provider Directory | HPD | A method to record provider information in and query provider information from a directory, using LDAP. Includes the ability to record organizational and departmental information. Philips user-facing interoperability products support looking up and using organizational and departmental information as a Provider Information Consumer. |

**Other standards**
Beyond the IHE Integration Profiles, that leverage existing standards, a number of extra standards are implemented where they do not have an equivalent IHE profile.

| Standard | Description |
|---|---|
| DICOM | DICOM is a standard for peer-to-peer transmitting and discovering images and related information between computer systems. It is targeted at Local Area Networks and VPNs, with some recent extensions into web technology.<br><br>The Philips Interoperability Platform offers various levels of DICOM support to be able to connect traditional DICOM systems to XDS(-I) networks. A brief overview:<br>• DICOM systems can store information, which will register the stored instances in the XDS network and cache them for later retrieval<br>• The Philips Interoperability Platform can request images from DICOM origin using C-MOVE for retrieval by XDS-I consumers<br>• it can push images to a local DICOM system when a user requests a study to be exported<br>• DICOM systems can use query/retrieve (C-FIND/C-MOVE) in order to discover and retrieve studies available in an XDS-I network.<br>• The Philips Interoperability Platform can query a DICOM Worklist in order to reconcile information during an export.<br><br>IHE defines integration profiles that make use of DICOM, but for other use cases than health information exchange. The Philips Interoperability Platform claim specific conformance to e.g. the IHE Radiology Scheduled Workflow profile, but it does adhere to the technical transactions defined in those profiles where applicable. |
| HL7v2 | HL7 version 2 is a standard for peer-to-peer communication of patient administration information, clinical orders and clinical observation results that has a very broad established base in healthcare IT. It is targeted at usage on Local Area Networks and VPNs.<br><br>Beyond the support for HL7 v2 messages as described by the IHE profiles above (e.g. PIX and PDQ), the Philips Interoperability Solutions support HL7 version 2 for a variety of use cases beyond IHE profiles, such as:<br>• Automatic publication of reports and other clinical results into the XDS network that are sent to forConnect by HL7<br>• Automatic sending of HL7 messages when triggered by XDS events<br>• Manual sending of clinical order and other information when triggered by submitted forView forms.<br><br>IHE defines integration profiles that make use of HL7v2, but for other use cases than health information exchange. Where applicable the Philips components support the IHE integration profiles for its HL7 transactions (e.g. see the PIX and PDQ profiles in the Patient Identity chapter), but where IHE Integration profiles are not available for the use cases implemented by our products, they adhere to the spirit of the transactions as much as possible. |
| WADO-WS | A part of the DICOM standard, WADO over Web-Services (WADO-WS for short) is an alternative implementation of the WADO standard that leverages web services technology. The standard can be used to query for and retrieve images over the web. The use case is the same as the use case for regular WADO, but the use of web services allows it to be used in contexts where other web service profiles are deployed side-by-side.<br><br>Philips Interoperability Solutions support WADO-WS above and beyond the XDS-I and XCA-I standards to offer the additional functionality of retrieving JPEG representations of images across communities (i.e., over XCA gateways). |

| Standard | Description |
|---|---|
| CDA | The HL7 Clinical Document Architecture is an XML-based document format that uses the concepts from the HL7 version 3 Reference Information Model to create clinical documents. CDA documents always contain a header with clinical context information, along with a body that can contain unstructured or structured clinical information. A method is also described that leverages XML Stylesheets to render HTML output for displaying the documents on the consumer side.<br><br>Philips Interoperability Solutions use CDA as one of the main clinical document formats for many types of clinical domains. If possible we try to adhere to as many guidelines as possible for specific clinical scenarios. Since the complete CDA creation and rendering pipelines are customizable we can support local templates that address customer use cases during installation, configuration, and integration phases.<br><br>Many of the supported IHE templates have been described in the Clinical content chapter above, such as XDS-MS. We can support other implementation guidelines such as CCD, CCR, HITSP C28/C32/C37, HL7 IHE Health Story Consolidation and local guidelines such as the Dutch 'Klinische Bouwstenen' by NICTIZ. |

### Making it work together

These standards and profiles all come together to help clinical users of a health information exchange perform their day-to-day tasks. You don't see them, but they are there supporting you at every step. Consider the following hypothetical scenario to understand how standards interact.

Imagine you complete an imaging report in your RIS, which sends the report to the Philips Interoperability Platform via HL7 v2. The platform uses DICOM to automatically discover related image information in a connected PACS. The report is converted to an XDS-SD or XDS-MS compatible document, while the availability of the images is recorded in an XDS-I manifest. At the same time, a new eReferral workflow is created (XBeR-WD and XDW), the report and image manifest are linked to the first workflow step and all the documents are submitted to the XDS Document Repository. The documents are then stored on disk and registered with the regional Document Registry. The component responsible for notifications receives an alert that there is a new registration, which triggers an email to be sent to the documented recipient, notifying him or her of an incoming referral.

The user clicks the link in the email, the browser opens and the user is automatically authenticated via his/her Microsoft Windows account (EUA). Additional information for the user, such as organizational information, is retrieved from the Active Directory (HPD). The viewing component of the platform retrieves the patient details from the Master Patient Index (PDQ) and queries for the incoming workflows. The registry verifies that the user (who was made known through XUA) is authorized and checks the patient consent information (BPPC). Although the network uses a national patient identifier to share information, the user is shown the local patient identifier (PIX). The user clicks the information icon to find out details about the author of the report (PWP). The user views the referral information and can open the attached report and images (which are retrieved via XDS-I). All of the information is sent over secured connections and audited with the audit record repository using the ATNA profile.

# Philips Interoperability Solutions Standards Compliance

As you can see from tables above, building an HIE is not a simple matter of supporting a single standard or profile in one or more roles. It requires implementation effort on many levels, and it will only be truly interoperable if standardization is achieved across all these levels. We believe standardization is a cornerstone of building an HIE. For this reason, we have incorporated standards at every level.

## What makes our solutions unique?

**Customizable by design**

- Access a wide range of workflow support solutions to meet your specific workflow needs and domain challenges
- Choose on-premise or SaaS (software as a service) models to suit your requirements

**Scalability by design**

- Build a foundation that's future-ready to evolve with your organization
- Share information within and beyond your organization and adapt to changing needs
- Integrate systems and support your network as it develops

**Secure by design**

- Improve data security with configurable role-based access control
- Consider and document patient consent when deciding who can access medical records
- Allow secure access to clinical documents
- Support secure processes with a separate audit log for transactions involving medical data

# Appendix: European Commission identifies 27 IHE Profiles for use in public tenders

## On July 28, 2015, the European Commission identified 27 IHE Profiles for use in public tenders.

1. IHE XCPD: Cross-Community Patient Discovery;
2. (*) IHE XCA: Cross-Community Access;
3. IHE XCF: Cross-Community Fetch;
4. (*) IHE XDR: Cross-Enterprise Document Reliable Interchange;
5. (*) IHE CT: Consistent Time;
6. (*) IHE ATNA: Audit Trail and Node Authentication;
7. (*) IHE BPPC: Basic Patient Privacy Consents;
8. (*) IHE XUA: Cross-Enterprise User Assertion;
9. (*) IHE PRE: Pharmacy Prescription;
10. (*) IHE DIS: Pharmacy Dispense;
11. (*) IHE XPHR: Exchange of Personal Health Record Content;
12. (*) IHE XD-MS: Cross-Enterprise Sharing of Medical Summaries Integration Profile;
13. (*) IHE XD-SD: Cross-Enterprise Sharing of Scanned Documents;
14. (*) IHE PIX: Patient Identifier Cross-Referencing;
15. (*) IHE PDQ: Patient Demographics Query;
16. (*) IHE XDS.b: Cross-Enterprise Document Sharing;
17. (*) IHE XDS-I.b: Cross-Enterprise Document Sharing for Imaging;
18. (*) IHE XD-LAB: Laboratory Reports;
19. (*) IHE XDM: Cross-Enterprise Document Media Interchange;
20. IHE SVS: Sharing Value Sets;
21. IHE SWF: Radiology Scheduled Workflow;
22. IHE SWF.b: Radiology Scheduled Workflow;
23. IHE PIR: Patient Information Reconciliation;
24. IHE PAM: Patient Administration Management;
25. IHE LTW: Laboratory Testing Workflow;
26. IHE LCSD: Laboratory Code Sets Distribution;
27. IHE LWA: Laboratory Analytical Workflow

The profiles with (*) are fully supported by Philips, and were tested at IHE Connectathons.

XCPD (Cross Community Patient Discovery) is not supported, but we provide a mechanism based on IHE PDQv3 that is similar in form and function for cross-community patient demographics discovery.

XCF (Cross Community Fetch) is a single transaction to query and retrieve a (set of) documents for a patient. Our solution does not support this profile, but supports XCA, through which the same functionality can be achieved via an individual query and a retrieve operation.

SVS (Sharing Value Sets) is not supported.

The other profiles are domain specific, and are supported “at the edge” of the department:

- Departmental radiology workflow (SWF, SWF.b, PIR): We support the transactions necessary to bridge the gap to XDS.
- Patient Administration Management (PAM): Our solutions support the patient feed transactions required to feed the patient index.
- Departmental lab workflow (LTW, LCSD, LWA): our solutions support the outbound lab results messages, in order to bridge to XDS.

As we are not an official actor in the workflows described in these profiles, IHE Connectathon testing for these transactions was not officially recorded.




4522 991 56011 * DEC 2019

www.philips.com/interoperability-solutions