

# HITSP Pseudonymize Transaction

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HITSP/T24



Healthcare Information Technology Standards Panel

*Submitted to:*

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*Submitted by:*

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(Formerly Security and Privacy Technical Committee)**



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## 1.0 INTRODUCTION

### 1.1 OVERVIEW

Anonymization, according to the International Organization of Standardization (ISO), is the process that removes the association between the identifying data set and the data subject. Pseudonymization is a particular type of anonymization that both removes the association with a data subject, and adds an association between a particular set of characteristics relating to the data subject and one or more pseudonyms. This enables a process of supplying an alternative identifier, which permits a patient to be referred to by a key that suppresses his/her actual identification information. The purpose of this Transaction is to describe a framework for including Pseudonymization Services in Use Cases that require the use of “dummy” or pseudo references to specific patients or providers. Pseudo-identifiers are intended to allow accessibility to clinical information, while safeguarding any information that may compromise the privacy of the individual patient or provider. Using pseudo-identifiers can assist in compliance with HIPAA regulations regarding suppression of patient identification information.

This Transaction can be used in conjunction with HITSP/TP22 Patient ID Cross-Referencing. The operation of the Pseudonymization Services in the context of the PIX Interface is described in the present document.

Use Cases for patient identification suppression are described in Section 2.1, “Context Overview.”

### 1.2 COPYRIGHT PERMISSIONS

#### COPYRIGHT NOTICE

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### 1.3 REFERENCE DOCUMENTS

This section provides a list of key reference documents and background material. If you are already familiar with this information, proceed to Section 2.0.

A list of key reference documents and background material is provided in the table below. These documents can be retrieved from the [www.hitsp.org](http://www.hitsp.org) Web Site.

**Table 1-1 Reference Documents**

Reference Document	Document Description
<a href="#">HITSP Acronyms List</a>	Lists and defines the acronyms used in this document
<a href="#">HITSP Glossary</a>	Provides definitions for relevant terms used by HITSP documents
<a href="#">TN900 - Security and Privacy Technical Note</a>	TN900 is a reference document that provides the overall context for use of the HITSP Security and Privacy constructs



## 1.4 CONFORMANCE

This section describes the conformance criteria, which are objective statements of requirements that can be used to determine if a specific behavior, function, interface, or code set has been implemented correctly.

### 1.4.1 CONFORMANCE CRITERIA

In order to claim conformance to this construct specification, an implementation must satisfy all the requirements and mandatory statements listed in this specification, the associated HITSP Interoperability Specification, its associated construct specifications, as well as conformance criteria from the selected base and composite standards. A conformant system must also implement all of the required interfaces within the scope, subset or implementation option that is selected from the associated Interoperability Specification.

Claims of conformance may only be made for the overall HITSP Interoperability Specification or Capability with which this construct is associated.

### 1.4.2 CONFORMANCE SCOPING, SUBSETTING AND OPTIONS

A HITSP Interoperability Specification must be implemented in its entirety for an implementation to claim conformance to the specification. HITSP may define the permissibility for interface scoping, subsetting or implementation options by which the specification may be implemented in a limited manner. Such scoping, subsetting and options may extend to associated constructs, such as this construct. This construct must implement all requirements within the selected scope, subset or options as defined in the associated Interoperability Specification to claim conformance.



## 2.0 TRANSACTION DEFINITION

### 2.1 CONTEXT OVERVIEW

This Transaction is defined to support pseudonymization of protected health information. Pseudonymization is a particular type of anonymization that both removes the association with a data subject and adds an association between a particular set of characteristics relating to the data subject and one or more pseudonyms. This may be provided for the patient or a provider. This construct is currently limited to patient-centric transactions where the primary subject of the pseudonymization request is a patient, and where the information about that patient may contain provider identifiers that may need to be Pseudonymized.

The following paragraphs provide further description of this construct from the context of specific Use Cases:

#### A. Standard Use Case<sup>1</sup>

In the standard Use Case, a Clinical Information System leverages a Patient Identity Source to issue and provide (via the Patient Identity Feed) identification and demographic information about a person to a Person Identifier Cross-Reference (PIX) Manager. A PIX Manager is a type of Person Identification Service. The Person Identification Service registers this patient and/or provider identity information and invokes Pseudonymization Services (a trusted third party) to obtain pseudo-identifying information to be provided to, and used by, Person Identity Consumers. This includes supporting an inquiry about the person in the context of the originating Clinical Information System's domain. The pseudo-identifying information provided for this person in response to the originating Clinical Information System's Patient Identity Feed is unique and distinct from the information provided in response to any other Clinical Information System's Patient Identity Feed.

A second Clinical Information System may issue an Identity Feed to the Person Identification Service containing identification and/or demographic information about the same person within a different domain. As with the first Patient Identity Feed described above, the Person Identifier Cross-Reference Manager will register this information and invoke Pseudonymization Services to obtain pseudo-identifying information (in the context of this second Clinical Information System's domain). This information is then provided to the Person Identity Consumers that inquire about the person, including the originating Clinical Information Systems. The pseudo-identifying information provided for this person in response to this second Clinical Information System's Person Identity Feed is unique and distinct from the information provided to any other Clinical Information System's Person Identity Feed, including that of the first Clinical Information System.

Person Demographics are not returned. They are only used to get pseudonymization data. To address times when supplied demographics differ from the Record Locator Service, the implementation approach needs to be defined. In cases where demographic information is not available (e.g., for a laboratory receiving an order), the Record Locator Service will have to support definition of a pseudonymized identifier without demographic data.

#### Relationships among Real and Pseudo-identifiers

The Person Identity Cross-Reference Manager maintains associations among all identifiers for a person, both real and pseudo-identifiers, in all domains. Pseudo-identifiers will be provided in response to any Get Person Identifier request by any domain having a relationship with the Person Identity Cross-Reference Manager. However, note that only the Person Identity Cross-Reference Manager is aware of the relationships among all the "real" identities of the person. Each data source (e.g., Clinical information

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<sup>1</sup> Future considerations are necessary to generalize the purpose, the types of HL7 Feeds that may be leveraged, and to harmonize with the HITSP Security and Privacy TC ongoing and pending efforts in identity management.



System) only knows the “real” identifying information that it assigns and maintains, while the data target (e.g., public health agency, quality measurement system) does not know any “real” identifying information.

## **B. Public Health Extension**

As an extension of the standard Use Case given immediately above, a Public Health Agency may receive information about individual patients within its jurisdiction, from documents or transactions. This Use Case extension supports the scenario where there is a reason to maintain such information in a pseudonymized information resource (e.g., for Biosurveillance). In this extension, the Patient Identifier Cross-Reference (PIX) Manager (from HITSP/TP22 - Patient Identifier Cross-Referencing) is an instantiation of a Person Identification Service. Prior to the transmission of the information about individual patients, the Patient Identifier Cross-Reference Manager (PIX Manager) can be directed to invoke the Pseudonymization Services to allot a third set of pseudo-identifying information to be transmitted to the Public Health Agency. This will suppress the actual identification of the patient.

## **C. Quality Extension**

As an extension of the standard Use Case given above, a Quality Measure and Reporting Enterprise may receive information about individual patients from documents or transactions. The information sent may also include provider information. This Quality Extension supports the case where there is a reason to communicate pseudonymous information related to the patient, the provider, or both. In this extension, the Patient Identifier Cross-Reference (PIX) Manager (from the HITSP/TP22 - Patient Identifier Cross-Referencing) is an instantiation of a Person Identification Service for the patient. To suppress the actual identification of the patient, prior to the transmission of the information sent to the Quality Measure and Reporting Enterprise, the Patient Identifier Cross-Reference (PIX) Manager can be directed to invoke the Pseudonymization Services to allot a third set of pseudo-identifying information to be transmitted to the Quality Measure and Reporting Enterprise. For suppressing the identification of the provider, prior to the transmission of the information sent to the Quality Measure and Reporting Enterprise, the Person Identification Service can be directed to invoke the Pseudonymization Service to allot a third set of pseudo-identifying information to be transmitted to the Quality Measure and Reporting Enterprise.

Pseudonymization through the trusted third party can support re-identification. Where the implementation requires re-identification, such as to support case investigation and other public health event detection and management, it is expected that re-identification will be executed in accordance with ISO/TS 25237. Reasons for re-identification (per ISO/TS 25237) that should be considered in future specifications include:

- Verification and validation of data integrity
- Checking for suspected duplicate records
- Enabling requests for additional data
- Linking to supplement research information variables
- Compliance audits
- Informing data subjects or their care providers of significant findings
- Facilitating follow-up research
- Law enforcement





### 2.1.1 TRANSACTION CONSTRAINTS

**Table 2-1 Transaction Constraints**

Constraint
Patient Identity Consumers may not receive real identifiers. They may receive only pseudo-identifiers, for patient records outside their own domain
Systems may be integrated to allow organizations implementing HITSP/T23 - Patient Demographics Query to receive pseudonymized identification information. This is done by binding a PDQ interface to a PIX interface in one of the following groupings: PDQ Patient Demographics Supplier with PIX Patient Identifier Cross-Reference Manager PDQ Patient Demographics Supplier with PIX Patient Identifier Cross-Reference Consumer PDQ Patient Demographics Consumer with PIX Patient Identifier Cross-Reference Consumer Implementation considerations for each of these groupings are discussed in IHE IT Infrastructure Technical Framework, Volume 3 [IHE ITI-TF-2 V4.0] Appendix M, "Using Patient Demographics Query in a Multi-Domain Environment"

### 2.1.2 INTERFACES

**Table 2-2 Interfaces**

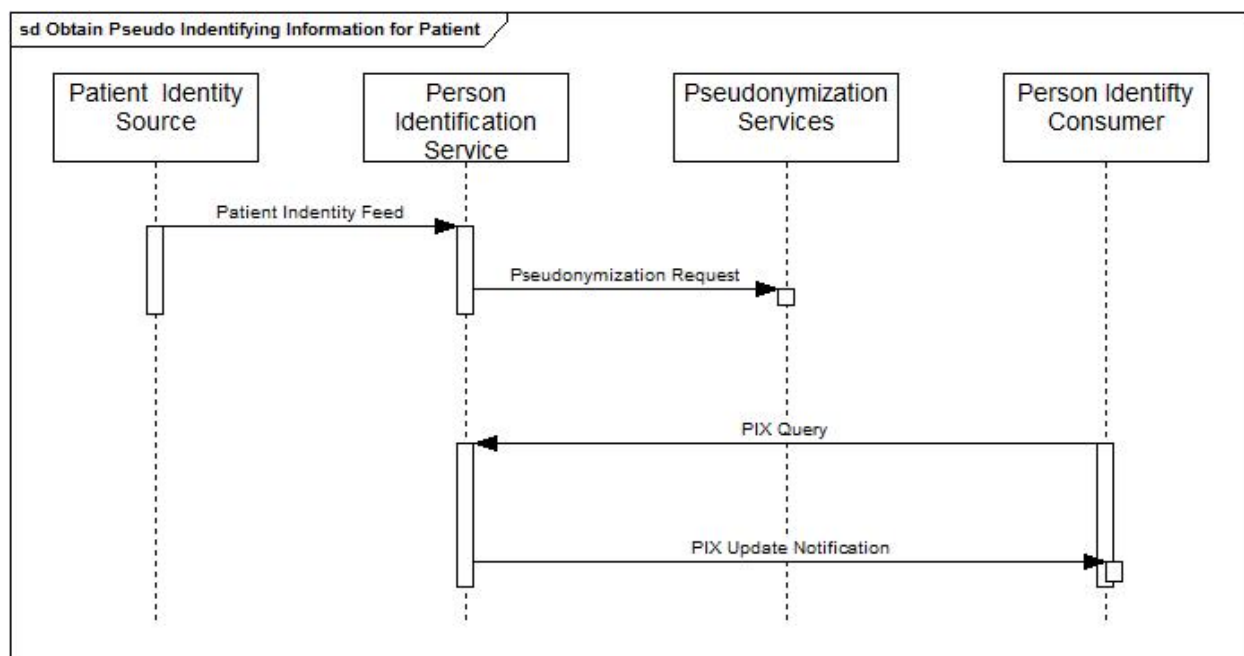
Interface	Description	Used in Construct/ Standard	Transaction/ Content	T/C Optionality <sup>2</sup>
Patient Identity Source	Sends patient demographic information to the Patient Identifier Cross-Reference (PIX) Manager. Patient demographic information sent may also contain provider identifiers for pseudonymization processing	HITSP/TP22	PIX Identity Feed	R
Person Identification Service (for patient-centric transactions, this is the Patient Identifier Cross-reference (PIX) Manager)	System that maintains a cross-domain person and/or patient index including all known identifiers (real and pseudo) for each person and/or patient, within all domains with which it communicates	HITSP/TP22	Patient Identity Feed	R
		HITSP/TP22	PIX Query	R
		HITSP/TP22	PIX Update Notification	R
		HITSP/T24	Pseudonymization Request	R
Pseudonymization Services	Module or service that can be invoked by Patient Identifier Cross-Reference (PIX) Manager (see next section) to return pseudo-identifier upon request	HITSP/T24	Pseudonymization Request	R
Person Identity Consumer (for patients, this is Patient Identity Consumer)	System that wishes to know alternate identifiers (real and pseudo) for person and/or patients within its domain or pseudo-identifiers for person and/or patients outside its domain	HITSP/TP22	PIX Query	R
			PIX Update Notification	O

<sup>2</sup> Optionality = "R" for Required, "R2" for Required if known, "O" for Optional, or "C" for Conditional. Conditional footnotes are further described below.



### 2.1.3 INTERFACE INTERACTIONS

Figure 2-1 Interface Interactions



To obtain pseudo-identifying information for a person, a Person Identification Service invokes Pseudonymization Services via a remote procedure call (RPC). The Person Identification Service passes *person demographic information* to the Pseudonymization Services. The Pseudonymization Services then use a cryptographic algorithm to map the person demographic information that is subsequently returned to the caller.

The following sections provide additional detail regarding the processes and conditions within each of the identified interfaces that are identified above.

### 2.1.4 PRE-CONDITIONS

Table 2-3 Pre-conditions

Pre-condition
It is expected that the security framework under which this Transaction operates is in accordance with the Interoperability Specification that references this construct. Therefore all applicable HITSP Security and Privacy constructs are implemented as required
Patient Identifier Cross-Reference Manager will have established a relationship of trust with the Pseudonymization Services
The Patient Identity Source will be known both to the Patient Identifier Cross-Reference (PIX) Manager and to the Pseudonymization Services

#### 2.1.4.1 PROCESS TRIGGERS

Table 2-4 Process Triggers

Process Trigger
Pseudonymization is needed for patient and/or provider



### 2.1.5 POST-CONDITIONS

**Table 2-5 Post-conditions**

Post-condition
No applicable post-conditions

### 2.1.5.1 REQUIRED OUTPUTS

**Table 2-6 Required Outputs**

Required Output	Format/Usage
An alternative identifier that permits a patient to be referenced by a key that suppresses his/her actual identification information is supplied	Not specified at this time

### 2.1.6 DATA FLOWS

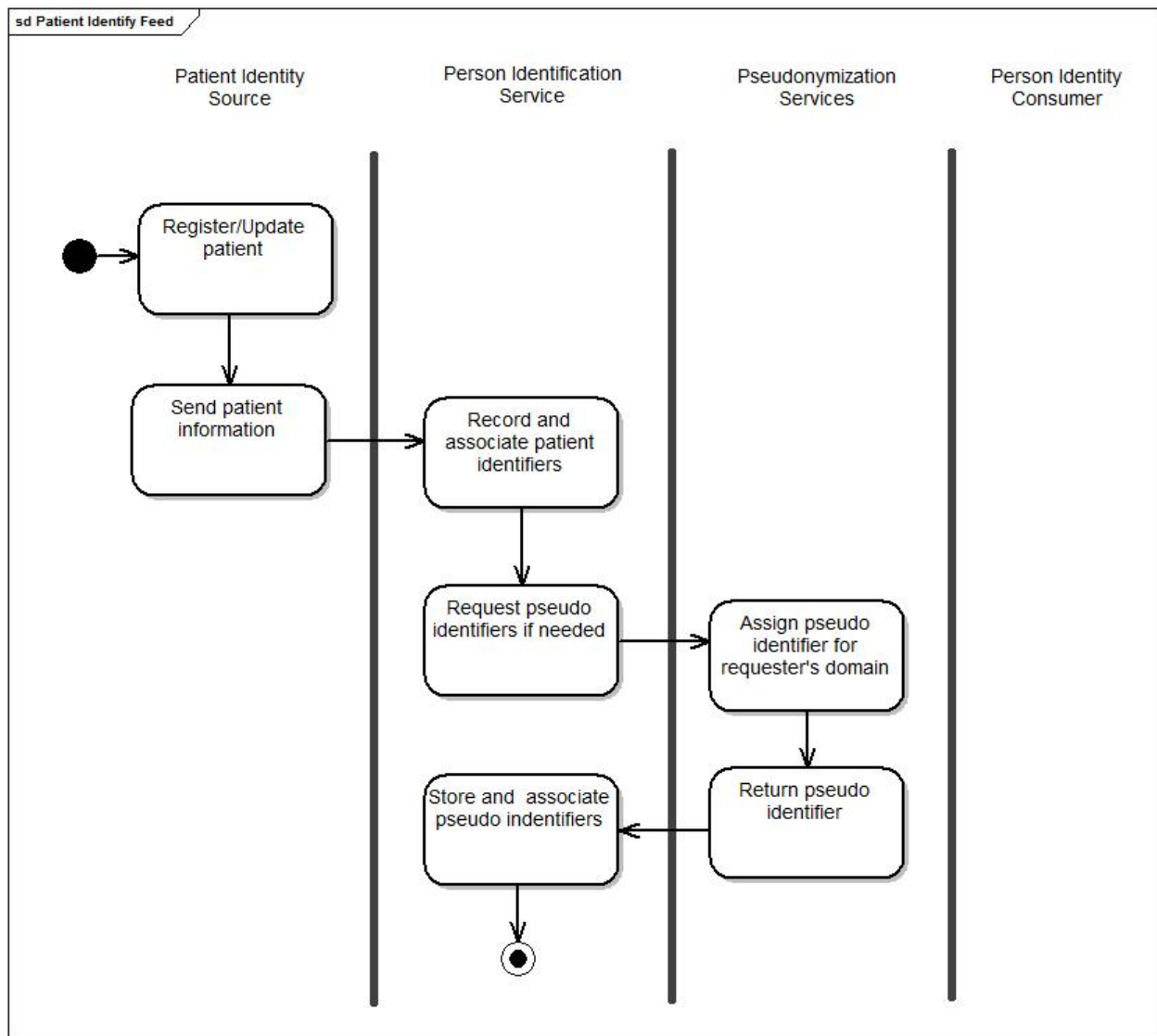
The subsections below describe the inclusion of the Pseudonymization Services within the PIX related transactions. Additional details of the data flows of the Patient Identity Feed, PIX Query, and PIX Update Notification may be found in HITSP/TP22 Patient ID Cross-Referencing.

#### 2.1.6.1 PATIENT IDENTITY FEED

Figure 2-2 below describes the inclusion of the Pseudonymization Services within the Patient Identity Feed transaction. Additional details of the data flow may be found in HITSP/TP22 Patient ID Cross-Referencing.



**Figure 2-2 Patient Identity Feed**

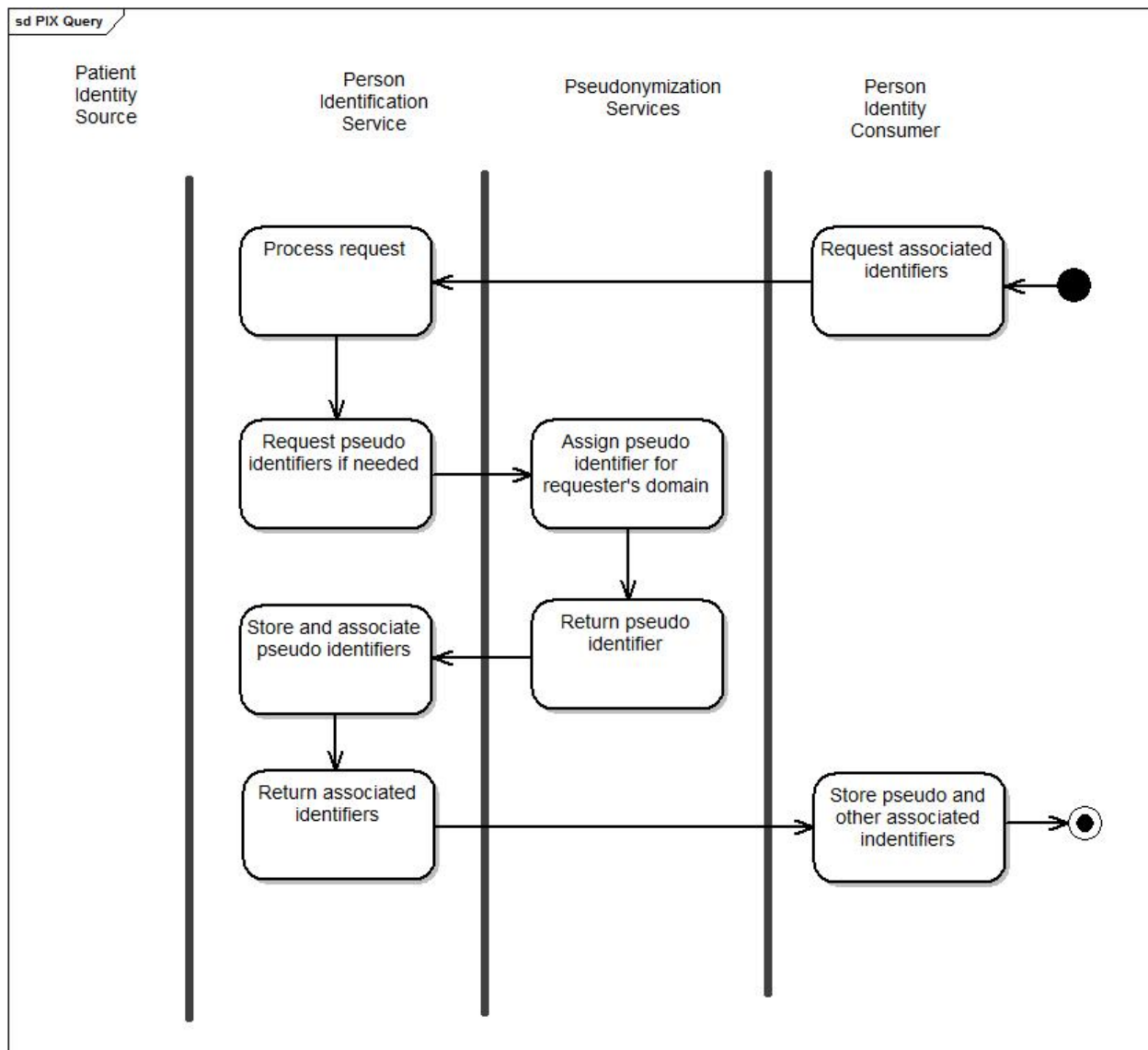


#### 2.1.6.2 PIX QUERY

Figure 2-3 below describes the inclusion of the Pseudonymization Services within the PIX Query transaction. Additional details of the data flow may be found in HITSP/TP22 Patient ID Cross-Referencing.



Figure 2-3 PIX Query

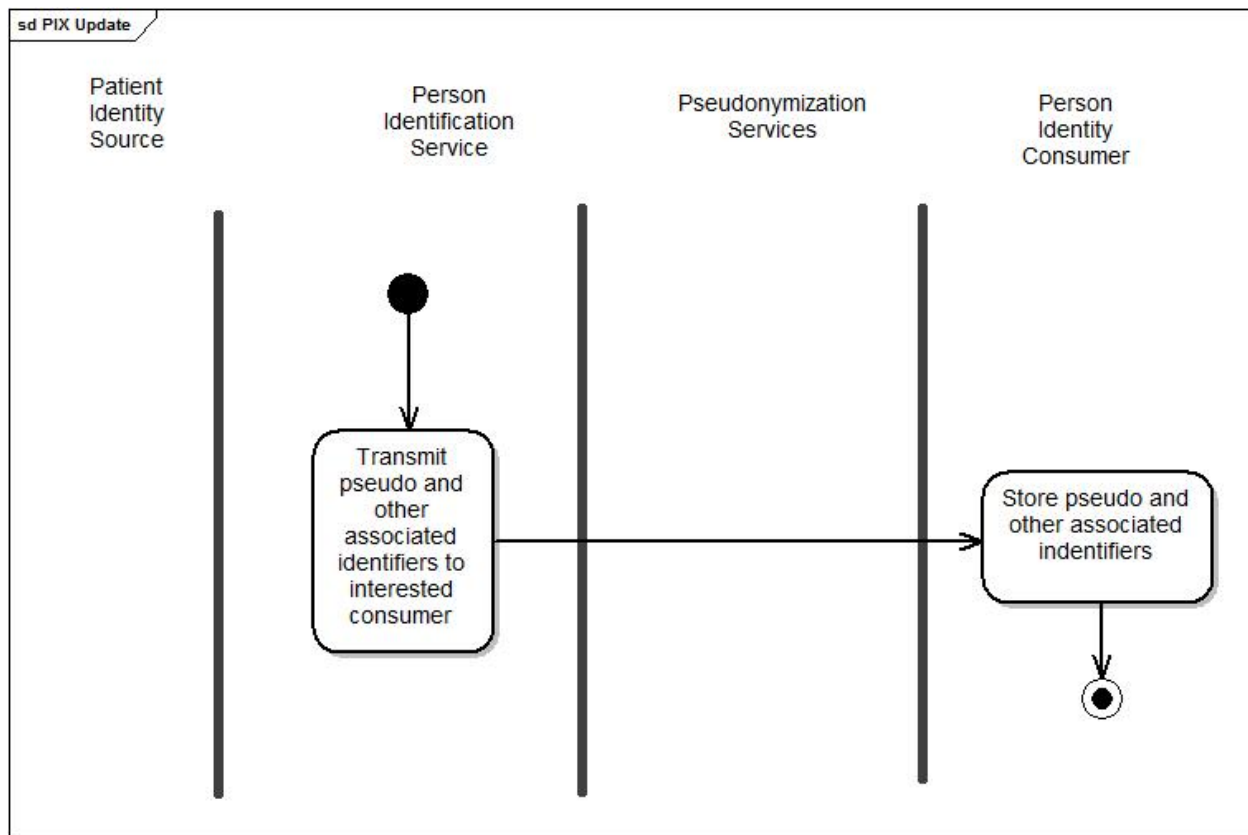


### 2.1.6.3 PIX UPDATE NOTIFICATION

Figure 2-4 below describes the inclusion of the Pseudonymization Services within the PIX Update Notification transaction. Additional details of the data flow may be found in HITSP/TP22 Patient ID Cross-Referencing.



Figure 2-4 PIX Update



## 2.2 LIST OF HITSP CONSTRUCTS

Table 2-7 List of HITSP Constructs

Construct Name	Interfaces	Description	Event/Action Code	Content
HITSP/TP22 - Patient ID Cross-Referencing	Patient Identity Source Patient Identity Cross-Reference Manager Patient Identity Consumer	These Patient ID Cross-Referencing (PIX) and Patient Identity Feed Transactions are portions of Interoperability Specifications that deal with identifying and cross-referencing different patient attributes for the same patient	NA	See HITSP/TP22 for details

### 2.2.1 CONSTRUCT DEPENDENCIES

Table 2-8 Construct Dependencies

Construct	Depends On (Name of Component that it depends on)	Dependency Type (Pre-condition, post-condition, general)	Purpose (Reason for this dependency)
No applicable dependencies			



## 2.2.2 ADDITIONAL CONSTRAINTS ON REQUIRED CONSTRUCTS

**Table 2-9 Additional Constraints on Required Constructs**

Data Element	Construct	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
QPD-3	HITSP/TP22 - Patient ID Cross-Referencing	For provider pseudonymization, the PIX Query message shall use the field QPD-3 Person Identifier to convey a single Person ID uniquely identifying the provider within a given Identification Domain	Pre-condition	To allow PIX Query message to support provider pseudonymization
PV1-7, PV1-8, PV1-9, PV1-17, PR1-12	HITSP/TP22 - Patient ID Cross-Referencing	For provider pseudonymization, the Patient Identity Feed shall include provider information in at least one of PV1-7, PV1-8, PV1-9, PV1-17, PR1-12 to be pseudonymized	Pre-condition	To convey the provider identifiers that need to be pseudonymized

## 2.3 STANDARDS

### 2.3.1 REGULATORY GUIDANCE

**Table 2-10 Regulatory Guidance**

Standard	Description
Health Insurance Portability and Accountability Act (HIPAA) -- Administrative Simplification	A listing of national standards plus rules adopted by federal regulation for electronically communicating specified administrative and financial healthcare transactions, and protecting the security and privacy of healthcare information, as applied to the three types of defined covered entities: health plans, healthcare clearinghouses, and healthcare providers who conduct any of the specified healthcare transactions. See the Code of Federal Regulations, Title 45, Parts 160, et. seq. for more information

### 2.3.2 SELECTED STANDARDS

**Table 2-11 Selected Standards**

Standard	Description
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 4.0	The IHE IT Infrastructure Technical Framework defines specific implementations of established standards to achieve integration goals that promote appropriate sharing of health information to support optimal patient care. IHE Integration Profiles, offer a common language that healthcare professionals and vendors may use in communicating requirements for the integration of products. The current version of the ITI-TF, rev. 4.0 for Final Text, specifies the IHE transactions defined and implemented as of August 22, 2007. The latest version of the IHE Technical Framework is available at <a href="http://www.ihe.net">www.ihe.net</a>
International Organization for Standardization (ISO) Health Informatics -- Pseudonymization, Unpublished Technical Specification # 25237	Health Informatics – Pseudonymization. Approved as a Technical Specification March, 2007. For more information visit <a href="http://www.iso.org">www.iso.org</a>



### 2.3.3 INFORMATIVE REFERENCE STANDARDS

**Table 2-12 Informative Reference Standards**

Standard Name	Description/Usage
Health Level Seven (HL7) Version 2.5 <sup>3</sup>	The HL7 Version 2.5 Messaging Standard is an application protocol for electronic data exchange in healthcare. It and prior versions have widespread use in the U.S. and internationally. Both message formats and value sets/code tables (e.g., diagnosis type, gender, patient class, result status, specimen collection method, abnormal flags, observation result status codes interpretation, timestamp format) are contained in the standard. Of particular focus for HITSP Interoperability Specifications are message formats described in Chapters 2, 3, 5, and 7 including patient demographic (ADT) and lab result reporting. These are also used within composite standards from IHE for Patient Identity Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), and Acknowledgements. For more information visit <a href="http://www.hl7.org">www.hl7.org</a>
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 4.0, Volume 2 Transactions, Appendix M Using Patient Demographics Query in a Multi-Domain Environment	Appendix M - Using Patient Data Query (PDQ) in a Multi-Domain Environment, provides an architectural discussion of how Query Parameter Definition, QPD-8 is processed

<sup>3</sup> HITSP references HL7 2.5.1 messaging for lab results reporting and HL7 2.5 for other messages. Future maintenance work will move toward referencing a single HL7 version across HITSP documents.





### 3.0 APPENDIX

The following sections include relevant materials referenced throughout this document.

No additional information at this time.



## 4.0 CHANGE HISTORY

The following sections provide the history of all changes made to this document since the last publication.

### 4.1 MAY 11, 2007

This document is now Released for Implementation.

### 4.2 DECEMBER 5, 2007

#### 4.2.1 GENERAL UPDATES

- Updated to new template
- Added support for provider data pseudonymization
- Generalized term 'patient' to 'person'

#### 4.2.2 SECTION 2.1

- Updated context to include Quality in addition to Public Health
- Updated the standard Use Case as a general person pseudonymization Use Case
- Added Quality Extension

#### 4.2.3 SECTION 2.2.2

- Added constraints to the Patient Identity Feed and PIX Query for support of provider pseudonymization

### 4.3 DECEMBER 13, 2007

Upon approval by the HITSP Panel on December 13, 2007, this document is now Released for Implementation.

### 4.4 JULY 11, 2008

Updated to place standards into 3 categories: Regulatory, Selected, and Informative References

### 4.5 AUGUST 20, 2008

This document has been modified to reflect the updated HITSP approach to categorizing standards as Regulatory Guidance, Selected Standards, and Informative References.

The following standard has been designated as regulatory guidance:

- Health Insurance Portability and Accountability Act (HIPAA) -- Administrative Simplification

The following standard has been designated as informative reference:

- Health Level Seven (HL7) Version 2.5

The following standard has been added as informative reference:

- Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 4.0, Volume 2 Transactions, Appendix M Using Patient Demographics Query in a Multi-Domain Environment



#### **4.6 AUGUST 27, 2008**

Upon approval by the HITSP Panel on August 27, 2008, this document is now Released for Implementation.

#### **4.7 JUNE 30, 2009**

Minor editorial changes were made to this document. Boilerplate text was removed for simplification. The term “actor” was replaced with “interface”.

#### **4.8 JULY 8, 2009**

Upon approval by the HITSP Panel on July 8, 2009, this document is now Released for Implementation.

