Integrating the Healthcare Enterprise

IHE Quality, Research, and Public Health Technical Framework Supplement

Newborn Admission Notification Information (NANI)

Rev. 2.1 – Trial Implementation

Date: August 10, 2016

Author: QRPH Technical Committee

Email: qrph@ihe.net

Please verify you have the most recent version of this document. See here for Trial Implementation and Final Text versions and here for Public Comment versions.

Foreword

This is a supplement to the IHE Quality, Research and Public Health (QRPH) Technical Framework. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on August 10, 2016 for trial implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the QRPH Technical Framework. Comments are invited and may be submitted at http://www.ihe.net/QRPH_Public_Comments.

This supplement describes changes to the existing technical framework documents.

"Boxed" instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend Section X.X by the following:

Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text **~~bold strikethrough~~**. When entire new sections are added, introduce with editor's instructions to "add new text" or similar, which for readability are not bolded or underlined.

General information about IHE can be found at www.ihe.net.

Information about the IHE Quality Research and Public Health domain can be found at http://www.ihe.net/IHE_Domains.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at http://www.ihe.net/IHE_Process and http://www.ihe.net/Profiles.

The current version of the IHE QRPH Technical Framework can be found at http://www.ihe.net/Technical_Frameworks.

CONTENTS

Introduction to this Supplement

The NANI Profile describes the content needed to communicate a timely newborn admission, and discharge event notifications to be used, for example, to inform public health Early Hearing Detection and Intervention (EHDI) screening programs. The Newborn Admission Notification Information (NANI) Profile optimizes and standardizes the sharing of patient admission and discharge data for a newborn to a receiving system, thereby eliminating the time and cost of manual data entry. Automating the delivery of these basic data will reduce the errors currently producing a challenge to jurisdictional programs that provide, for example, newborn screening services and evaluate quality of care delivered.

This supplement is written for Trial Implementation. It is written as an addition to the Quality, Research and Public Health Technical Framework.

This supplement references the following documents which the reader should review as needed:

HL7®[1] V2 Messaging for ADT Messages V2.3.1. This profile includes only the additional constraints added to the ADT message to support the NANI use cases.

Prior Work and Profile Changes

The EHDI family of profiles have undergone significant changes during their development:

- In the 2009-2010 cycle of the IHE QRPH initiative, the first Newborn Admission Notification was included as a component of the broader Early Hearing Detection and Intervention Integration Profile. The Early Hearing Care Plan was also developed as part of a broader integration profile.
- In the 2010-2011 cycle of the IHE QRPH initiative, the Early Hearing Care Plan (EHCP) was extracted from the 2009-2010 broader integration profile to create the EHCP Profile and published for public comment as a discrete content profile designed to communicate care plan expectations from public health to care providers for an individual patient based upon hearing screening results and risk indicators for hearing loss.
- Similarly, in the 2011-2012 cycle of the IHE QRPH initiative, the NANI Profile is extracted from the 2009-2010 broader integration profile and is presented here for public comment as a discrete content profile designed to communicate Admission Information from hospitals' EHRs to public health in order to improve the timeliness and accuracy of the birth cohort information to public health.

[1] HL7 is the registered trademark of Health Level Seven International.

- In the 2014-2015 cycle, the EHCP Profile was reworked and republished as part of a broader EHDI Profile. The EHDI Profile includes the Hearing Plan of Care CDA®[2] document and EHDI Hearing Screening Message specification.
- In 2016, the NANI Profile was simplified to remove use of the V3 NANIPublish transaction. During trial use of this profile, no users opted to implement the V3 transaction and instead used the V2 NANIFeed transaction for all transport within the profile. If use of a V3 transaction becomes needed, a new profile will be proposed to address V3, similar to the way ITI maintains two separate profiles for V2 and V3 message types. An additional event type (discharge) was added to facilitate additional workflow triggers needed for newborn hearing screening. The profile also was simplified to include only two actors, where previously there had been three. The actors were generalized to Information Source and Information Recipient. Their focus on newborn admission information is implied in the context of the profile.

Open Issues and Questions

None

Closed Issues

1. In the 2014-2015 cycle, the EHCP Profile was reworked and republished as part of a broader EHDI Profile. The EHDI Profile includes the Hearing Plan of Care CDA document and EHDI Hearing Screening Message specification.
2. Review Section 3.34.4.1.3 to see if the references to ITI TF-2a should be extracted and brought directly into this profile since the dependence on PID-8. CLOSED: Dependence on ITI-8 is removed; new transaction QRPH-34 is specified
3. Consent related issues jurisdictionally determined and, therefore, are out of scope. (For additional information about IHE consent related work, see ITI Framework).
4. Currently the content of the transaction between Newborn Admission Notification Manager and Newborn Admission Notification Subscriber is based on HL7 V3 Patient Administration. However, this could be CDA based as Public Health Reporting is moving to CDS. It could be V2 based but both are out of scope for this version.
5. What is the IHE way of specifying how the Newborn Admission Notification Manager can support different content/transactions? For example – ADT, CDA etc. – The IHE way to do this would be to use options on the actors. You might have to make one option required and others optional.
6. This profile based on jurisdictional rules MAY require pseudonymization to protect individual patient privacy. Based on the discussion at the face-to-face meeting, we

[2] CDA is the registered trademark of Health Level Seven International.

decided that this is a use case we do not want to solve in this profile just yet. This topic may be re-evaluated in future versions.

7. Is the role of manager restricted to public health? The NANI manager actor role can be performed by the hospital/birthing facility, HIE or public health.

8. Is it possible to generalize the profile with actors such as Admission Information Source, Admission Notification Manager and Admission Notification Subscriber and then implement the "Newborn" criteria as options on these actors? – YES – should be considered for future development of this profile.

9. Apart from NANIFeed [QRPH-34], the transaction between Admission Information Source and Newborn Admission Notification Manager may also support PIX Feed V3 [ITI-44]. Is PAM also an option?

10. A thorough review of the PIX Profile, including the Pediatric Demographics Option, was performed and consensus was reached on 1/22/2016 that the purpose and audience of the NANI Profile is sufficiently different from PIX to justify the need for NANI as a distinct profile.

11. Changes to Volume 4 were considered for message content specifications in QRPH-34 that may have needed to be moved to Volume 4 for the US Realm (race and ethnicity). However after discussing this in QRPH on January 22, 2016, it was agreed we will add an open issue, document the discussion, and mark the issue as closed. The approach for addressing race and ethnicity will be to address the 90% rule to include what is most generally required and then allow other domains to explain that they don't allow race and ethnicity to be shared/exchanged. This approach follows the pattern established in ITI TF-4: 4.1 French requirements related to Patient Administration and Management. In this example, base transactions —ITI-30 and 31 — are customized per national requirements. There are several customizations for France in this section, including the prohibiting use of some required fields in the base specification (Section 4.1.1.2).

12. Future scope may include update messages to provide public health with additional demographic information on a newborn. This issue was addressed with the 2016 Annual Update and the following event types were added: discharge (A03).

13. Figure out what "Newborn Record Filter" means and how to address this implied functionality. This is out of scope as it may differ by installation or jurisdiction. A clarification has been added to explain the issue of Newborn Record Filter in Section X.5.1.? This was also addressed by eliminating the Newborn Admission Notification Manager. As of February, 2016, the "filter and matching" functionality is addressed by the jurisdictional sharing requirements on the Information Source and the processing usage requirements of the Information Recipient.

14. Since the V3 NANIPublish [QRPH-35] transaction is no longer used, should it be deprecated? What steps would be needed to document the deprecation of QRPH-35? As of February, 2016, the NANIPublish [QRPH-35] transaction has been removed. No

requirement to formally deprecate the transaction resulted from the elimination of this transaction from the NANI Profile.

15. The prior decision regarding the requirements for ethnicity and race information were reversed at the February, 2016, Volume 1 finalization meeting. A decision was made to make inclusion of these fields optional in the Universal Realm profile and to add a message content module that can be documented in Volume 4 material to require inclusion of these fields for the US Realm.

16. The QRPH-34 transaction will not be described as specifically constraining ITI-8, the commonality in terms of using the same HL7 ADT message type will be noted. Although there are many consistent specifications between QRPH-34 and Patient Identity Management [ITI-30] transaction with the Pediatric Demographic Option, there are also key differences. The focus of the NANI Profile and the NANIFeed transaction are to provide standard information flow triggers to systems who are using the triggers to signal when information processing steps can begin or end, and to track transitions of care. This is a different purpose than the identity matching focus of PIX.

Volume 1 – Profiles

Copyright Permission

Add the following to the IHE Technical Frameworks General Introduction Copyright section:

NA

Add Section X

X Newborn Admission Notification Information (NANI) Profile Summary

The NANI Profile describes the content needed to notify another system of a newborn admission and discharge event. The newborn admission and discharge event notifications are used by the receiving system as workflow triggering events.

X.1 NANI Actors, Transactions, and Content Modules

Figure X.1-1 shows the actors directly involved in the NANI Profile and the relevant transaction between them.

There are two actors in this profile, the Information Source and Information Recipient. Event notification content is created by the Information Source based on jurisdictional requirements and data processing requirements of the Information Recipient. Event notification content is consumed and used by the Information Recipient.

The NANIFeed [QRPH-34] transaction is used by these actors to share the notification content. This transaction is similar in many ways to the Patient Identity Management [ITI-30] transaction with Pediatric Demographics Option. However, [QRPH-34] adds support for additional events that may be relevant when tracking newborn care.

The [QRPH-34] message content is further constrained in Volume 4 for use in the US Realm where race and ethnicity fields are required for reporting on process quality of public health programs for newborns.

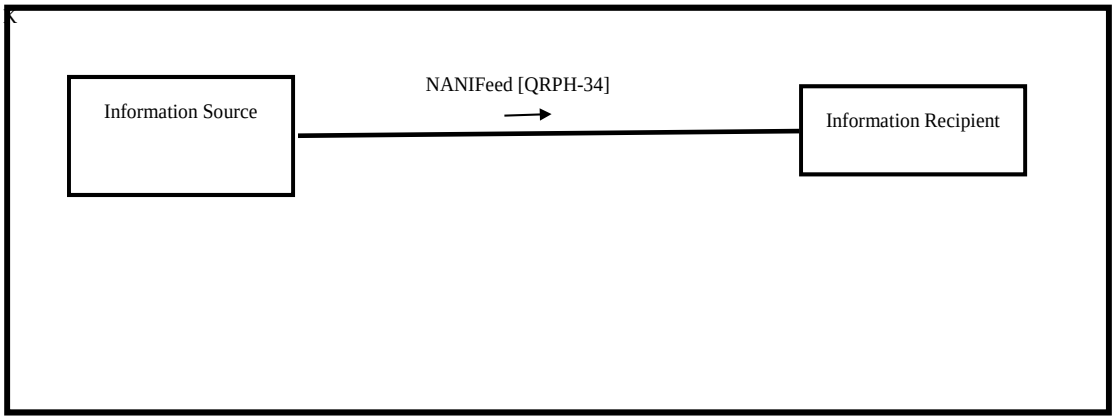


Figure X.1-1: NANI Actor-Transaction Diagram

Table X.1-1 lists the transactions for each actor directly involved in the NANI Profile. In order to claim support of this profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” are optional.

Table X.1-1: NANI Profile - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Information Source	NANIFeed [QRPH-34]	R	QRPH TF-2: 3.34
Information Recipient	NANIFeed [QRPH-34]	R	QRPH TF-2: 3.34

X.1.1 Actor Descriptions and Requirements

Most requirements are documented in Transactions (Volume 2). This section documents any additional requirements on this profile's actors.

X.1.1.1 Information Source

An Information Source SHALL populate admission event notification and discharge event notification content and transmit it to the Information Recipient for all newborns using the NANIFeed [QRPH-34] transaction.

X.1.1.2 Information Recipient

The Information Recipient SHALL be able to receive admission and discharge event content from the Information Source.

Accept appropriate admission notifications based on record filtering, matching specifications.

The Information Recipient MAY be able to:

Accept appropriate event notifications based on record filtering, matching specifications, and intended usage for newborn discharge, transfer, and update information.

X.1.2 Actor Requirements – National Extensions

X.1.2.1 National Extensions for the NANIFeed [QRPH-34] transaction

National extensions may define constraints to the NANIFeed [QRPH-34] transaction to support juristictional requirements. For example, see QRPH TF-4: 4.R1.2 for US-specific requirements. Other national extensions may be defined in the future.

X.2 NANI Actor Options

Options that may be selected for this profile are listed in the Table X.2-1 along with the actors to which they apply. Dependencies between options when applicable are specified in notes.

Table X.2-1: NANI - Actors and Options

Actor	Options	Volume & Section
Information Source	*No options defined*	- -

Actor	Options	Volume & Section
Information Recipient	*No options defined*	- -

X.3 Required Actor Groupings

An actor from this profile (Column 1) shall implement all of the required transactions and/or content modules in this profile ***in addition to*** all of the transactions required for the grouped actor (Column 2).

Section X.5 describes some optional groupings that may be of interest for security considerations and Section X.6 describes some optional groupings in other related profiles.

Table X.3-1: Required Actor Grouping

NANI Actor	Actor to be grouped with	Technical Framework Reference
Information Source	Consistent Time / Time Client	ITI TF-1: 7
Information Recipient	Consistent Time / Time Client	ITI TF-1: 7

X.4 NANI Overview

The Newborn Admission Notification Information (NANI) Profile optimizes and standardizes the sharing of patient admission, discharge, transfer and update data for a newborn to a receiving system, thereby eliminating the time and cost of manual data entry. Automating the delivery of these basic data reduces the errors currently producing a challenge to jurisdictional programs that provide, for example, newborn screening services and evaluate quality of care delivered.

Hearing loss identified with newborn hearing screening is considered a neuro-developmental emergency. Thus, hearing screening has received widespread acceptance by public health in the United States (US), England, Scotland and Australia. Projects are also underway worldwide, including Mexico, India and South America to implement systems that make sharing newborn hearing screening information more efficient and more effective.

Currently, for example, public health Early Hearing Detection and Intervention (EHDI) programs for newborn hearing screening do not have a consistent and reliable method to obtain a timely notification of a newborn's birth at a hospital or birthing facility. This lack of birth notification information complicates the task of assuring that all eligible newborns are screened at birth for hearing loss prior to hospital discharge. Regardless of how a hospital submits newborn hearing screening results to a jurisdictional hearing-screening program, critical information is often incomplete, inaccurate, late, or missing entirely. This has the potential to impact the delivery of care for an individual child and may lead to increased "lost to follow-up".

In this context, “lost to follow-up” means the infant does not receive the next steps in care: screening, diagnostic testing, or intervention then the infant is “lost to follow-up”. For example, it impacts an EHDI program’s quality and jeopardizes the program’s goal of providing all children screening by one month, diagnosis by 3 months, and intervention before 6 months. In the US, these goals are collectively known as the CDC 1, 3, 6 National Early Hearing Detection and Intervention (EHDI) Goals.

It is anticipated that the NANI Profile could be used by other child health programs.

X.4.1 Concepts

Care guidelines for newborns may include requirements on the encounter associated with the newborn’s birth event. Data communicated in an admission event notification to signal the admission is associated with a birth event may vary by jurisdiction. Agreements between Information Source and Information Recipient Actors may be needed to clarify how a birth event will be conveyed.

When a child is born outside of a care facility, then transported to a care facility and admitter for care subsequent to the birth event, the encounter is not considered the “birth encounter” and the admission event notification is not encoded using the pattern to indicate a birth event.

The term “transfer” may be used in spoken language to describe situations where a patient is moved from one care facility to another. Within the context of the NANI Profile the term “transfer” is restricted to mean the patient is discharged from the current facility and admitted to a new care facility. This use of the term “transfer” should not be confused with the more specific usage of the term “transfer” used by HL7 ADT A02 message definitions.

X.4.2 Use Cases

X.4.2.1 Use Case #1: Public Health Program is notified about a Birth Admission to a Hospital

X.4.2.1.1 Use Case Description

A child is born in the hospital. A newborn admission is done in the EHR to record the baby as a new patient as of the date and time of the baby’s birth.

X.4.2.1.1.1 Pre-condition

Encoding requirements for representing a birth encounter has been established between the Information Source and Information Recipient systems.

X.4.2.1.1.2 Main Flow

The message content is populated with the admission event content appropriate for a birth encounter. An admission event is communicated by the Information Source to the Information Recipient.

X.4.2.1.1.3 Post Condition

Information processing triggered by the notification event proceeds at the Information Recipient.

X.4.2.1.2 Processing Steps

1. Baby Joe Smith is born at a hospital and his demographic information is entered into the hospital's EHR system as a birth admission.
2. The hospital's EHR, acting as the Information Source, notifies Public Health, acting as the Information Recipient, about Baby Joe Smith's birth at the facility. Information about Baby Joe Smith's demographic details and his admission to the hospital's nursery are communicated in an admission notification. The information includes data to identify the encounter as a birth encounter.
3. The Information Recipient applies the appropriate filter and matching criteria for the admission and discharge events. The Information Recipient accepts and consumes admission and discharge event content, and rejects events not associated with birth. In some cases, the Information Source applies an appropriate filter so only birth admission and discharge events are sent to the Information Recipient.

X.4.2.1.3 Process Flow

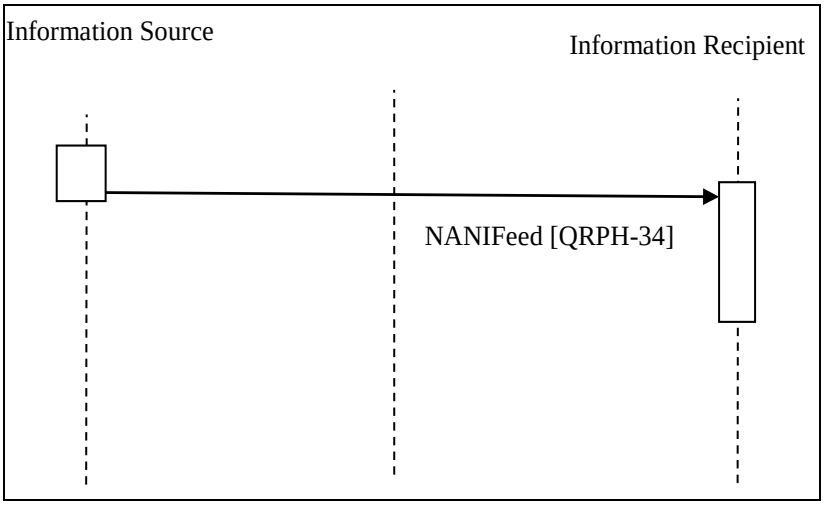


Figure X.4.2.1.3-1: Process Flow for a Newborn admission that is a birth encounter

X.4.2.2 Use Case #2: Public health program is notified about admission of a baby where the birth has occurred prior to hospital admission

X.4.2.2.1 Use Case Description

A woman goes into labor at her house. Her partner is at work and she home alone. She fears she will not be able to drive herself to the hospital. She calls 911 and an ambulance as dispatched. The baby is born at home before the EMTs arrive.

X.4.2.2.1.1 Pre-condition

Requirements for defining and representing a birth encounter has been established between the Information Source and Information Recipient systems.

X.4.2.2.1.2 Main Flow

The Information Source populates the event notification content. The admission event content does not indicate this is a birth encounter. The Information Source communicates the admission event notification to the Information Recipient.

X.4.2.2.1.3 Post Condition

Information processing triggered by the notification event proceeds at the Information Recipient.

X.4.2.2.2 Processing Steps

1. Baby Jeremiah Johnson is born at home. The newborn is transported to the hospital where he is admitted and his demographic information is entered into the hospital EHR system as an admission.
2. The hospital's EHR, acting as the Information Source, notifies Public Health, acting as the Information Recipient about Baby Jeremiah Johnson's admission, his demographic details and his admission to the hospital nursery. In this example, the admission does not include data which would indicate this is a birth encounter because the baby was born prior to the start of the encounter.
3. The Information Recipient applies the appropriate filter and matching criteria for the admission event to accept and consume the event content, or reject it.

X.4.2.2.3 Process Flow

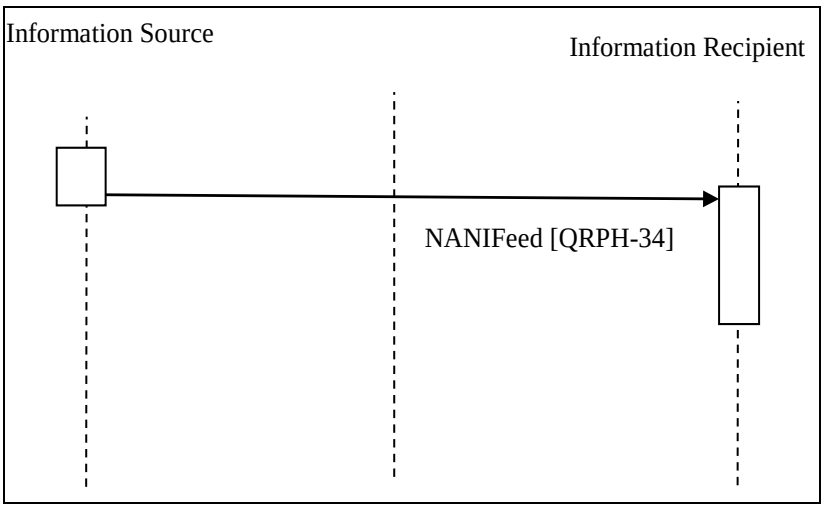


Figure X.4.2.2.3-1: Process Flow for a Newborn admission that is not a birth encounter

X.4.2.3 Use Case #3: Baby without first name is born in facility then moved to the NICU, subsequently named, then discharged to a different hospital

X.4.2.3.1 Use Case Description

The Information Source populates then communicates the birth admission event to the Information Recipient. The Information Recipient accepts the admission event content and initiates the triggered workflow.

Communication regarding the baby's departmental movement event from the Labor and Delivery department to the NICU is out of scope for this profile.

Communication regarding the patient update event when the baby is named is out of scope for this profile.

The Information Source populates then communicates the discharge event to the Information Recipient for James Michael Jones. The Information Recipient accepts the discharge event content and initiates the triggered workflow.

X.4.2.3.1.1 Pre-condition

Encoding requirements for representing event notification of birth encounter has been established between the Information Source and Information Recipient systems.

X.4.2.3.1.2 Main Flow

An admission event is communicated by the Information Source to the Information Recipient. The message content is populated. The admission event content indicates this is a birth encounter.

A discharge event is communicated from the Information Source to the Information Recipient. The discharge event carries updated patient name information that was not available at the time of admission (birth).

X.4.2.3.1.3 Post Condition

Information processing triggered by the notification events proceeds at the Information Recipient.

X.4.2.3.2 Procession Steps

1. Baby is born in a hospital but the parents do not name him right away. His demographic information is entered into the hospital EHR system as an admission but his name is recorded and Baby Johnson.
2. The hospital's EHR, acting as the Information Source, notifies Public Health, acting as the Information Recipient about Baby Johnson's admission, his demographic details and his admission to the hospital nursery. The admission uses the temporary name.
3. The Information Recipient applies the appropriate filter and matching criteria for the admission event to accept and consume the event content, or reject it.
4. At some point in the encounter, the parents inform the hospital that the baby's name will be Jeremiah.
5. When the baby is discharged, the EHR creates and sends a discharge message. The message includes the updated name for baby Jeremiah Johnson.

X.4.2.3.3 Process Flow

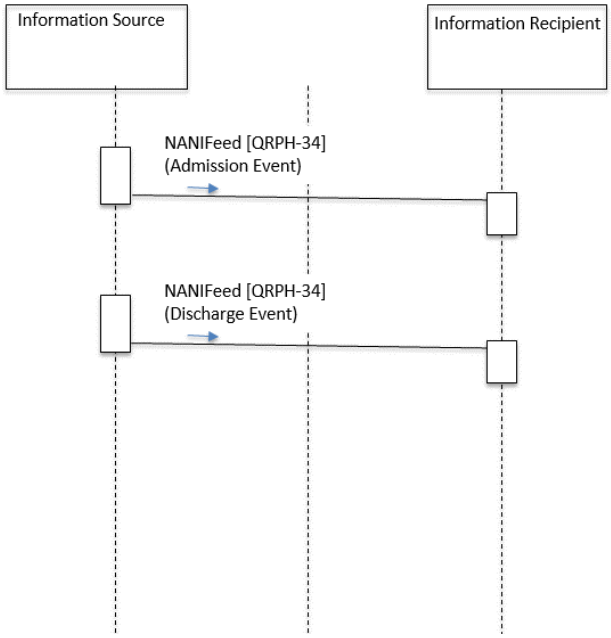


Figure X.4.2.3.3-1: Process Flow

X.4.3 Deployment Models

The Newborn Admission Notification Information Profile could be implemented by different systems. Depending on the jurisdiction requirements and the number of systems involved in the implementation, different profile actor roles can be played by different systems. This section describes some of the possible implementation options.

X.4.3.1 Deployment Model #1: Hospital sends event notifications required by the Public Health

In this scenario, the birthing hospital plays the role of the Information Source. The State EHDI Program plays the role of the Information Recipient. See Figure X.4.3.1-1.

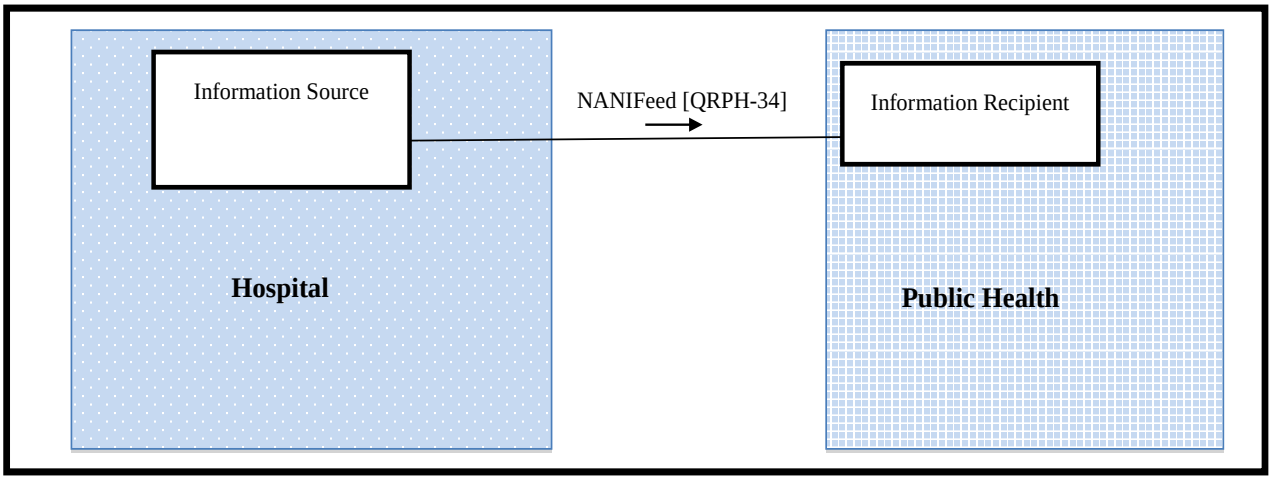


Figure X.4.3.1-1: Deployment Model 1 – Hospital plays the role of Information Source and Public Health plays the role of Information Recipient

X.4.3.2 Deployment Model #2: Hospital sends event notifications to a Health Information Exchange. The Health Information Exchange sends to an identified Public Health system only the event notifications required by that Public Health system.

This scenario assumes that the jurisdiction has a functioning Health Information Exchange which plays the Information Recipient and Information Source roles. The birthing hospital plays the Information Source role. The Information Recipient role is played by the State EHDI Program. See Figure X.4.3.2-1.

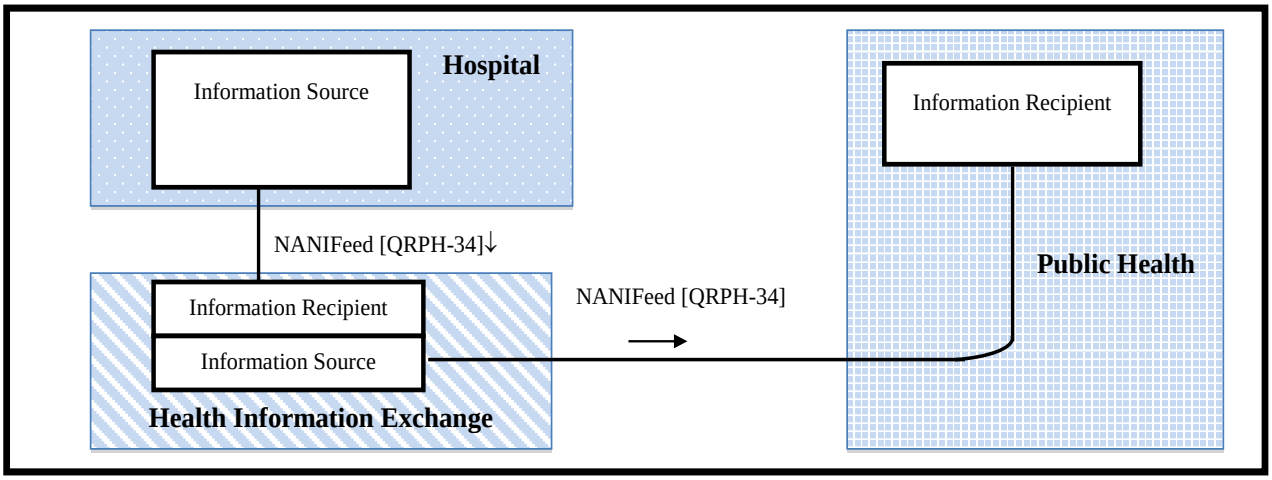


Figure X.4.3.2-1: Deployment Model 2 – Health Information Exchange plays the role of Information Recipient and the role of Information Source

X.4.3.3 Deployment Model #3: Hospital sends event notifications to a Public Health system. The Public Health system shares the event notification information with another Public Health system.

In this scenario, the State EHDI program plays two roles – Information Recipient and Information Source. The hospital EHR plays the role of Information Source. See Figure X.4.3.3-1.

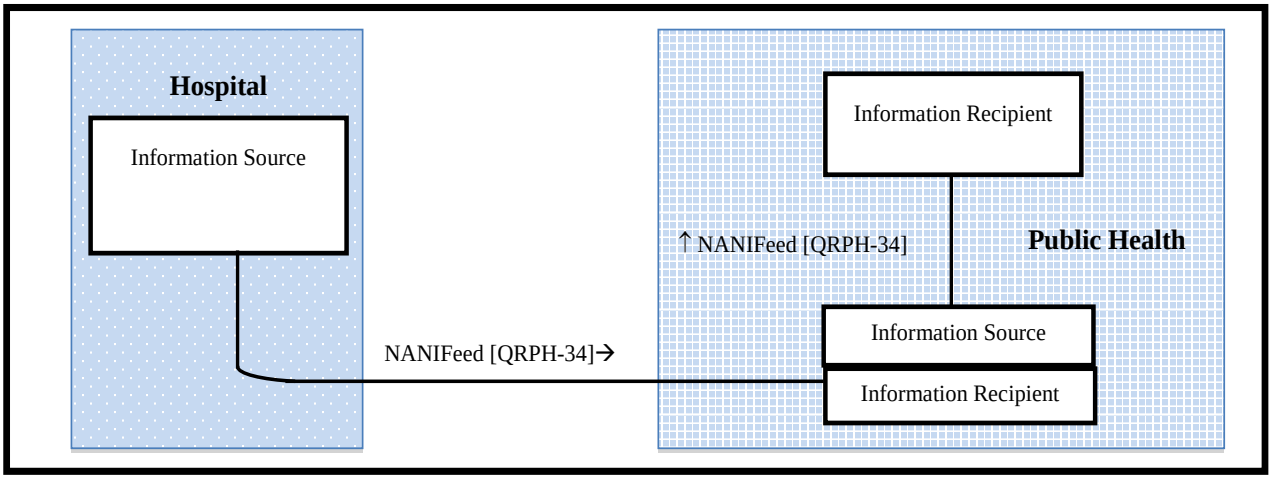


Figure X.4.3.3-1: Deployment Model 3 – Public Health System plays the role of Information Source to other Public Health System

X.5 Security Considerations

Implementers of this profile are advised that many risks cannot be mitigated by the IHE profile and instead the responsibility for mitigation is transferred to the vendor, and occasionally to the operational environment.

X.5.1 Audit Trail and Node Authentication (ATNA)

In order to address identified security risks all actors in NANI should be grouped with the Secure Node or Secure Application in the Audit Trail and Node Authentication (ATNA) Profile. This grouping will assure that only highly trusted systems can communicate and that all changes are recorded in the audit log.

X.6 Cross Profile Considerations

X.6.1 Consistent Time (CT)

In order to address identified security risks all actors in NANI shall be grouped with the Time Client in the ITI Consistent Time (CT) Profile (see Section X.3). Admission and discharge event reporting must be documented to include date and time to the level of precision required to support longitudinal processing of the information.

X.6.2 Sharing Value Sets (SVS)

Actors in the NANI Profile MAY support the ITI Sharing Value Set (SVS) Integration Profile in order to use a common uniform managed vocabulary for dynamic management of value set bindings, for example to do a look-up on HL7 Table 0007 (value set) to determine the allowable Admission types to populate in the IS field.

Appendices

Appendix A – Actor Summary Definitions

Add the following terms to the IHE TF General Introduction Namespace list of actors:

1. **Information Source**– a system that populates and communicates event notification information.
2. **Information Recipient** – a system that receives event notification information from another system. The system determines if it should receive and consume the event information. It uses the event notification information to trigger a workflow.

Appendix B – Transaction Summary Definitions

Add the following terms to the IHE TF General Introduction Namespace list of Transactions:

NANIFeed [QRPH–34] - The NANI Profile describes the content needed to notify another system of a newborn admission or discharge event. An event notification is used by the receiving system as a workflow triggering event.

Glossary

Add the following terms to the IHE Technical Frameworks General Introduction Glossary:

None

Volume 2 – Transactions

Add Section 3.34

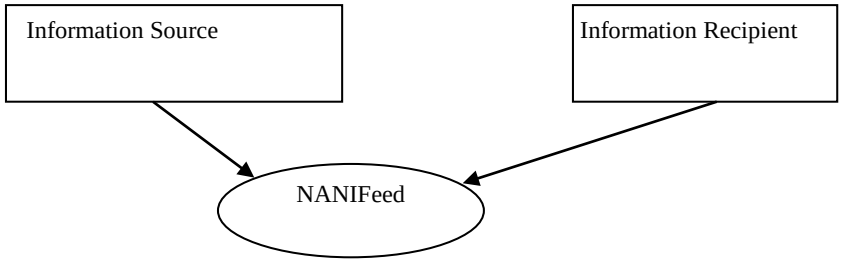
3.34 NANIFeed [QRPH-34]

This section corresponds to Transaction QRPH-34 of the IHE QRPH Technical Framework. Transaction QRPH-34 is used by the Information Source and Information Recipient Actors to share birth event notification information.

3.34.1 Scope

This transaction communicates event information, including corroborating demographic data, after a newborn is admitted or discharged.

3.34.2 Use Case Roles



Actor: Information Source

Role: Provides notification of an admission or discharge of a patient or person known to the Information Source. The event message includes information about the patient needed by the Information Resource.

Actor: Information Recipient

Role: Receives event notification information from the Information Source, applies matching and filtering rules to determine which content to accept and which content to reject. It receives or rejects event notification information based on the content matching and filtering rules.

(Note: definition of the matching and filtering rules are outside the scope of this technical specification.)

3.34.3 Referenced Standards

HL7 Version 2.3.1

This standard is publically available on the HL7.org website. Specifications for the admit/visit notification (A01) event message is in Chapter 3.2.1. Specifications for the discharge/end visit event message (A03) is in Chapter 3.2.3.

3.34.4 Interaction Diagram

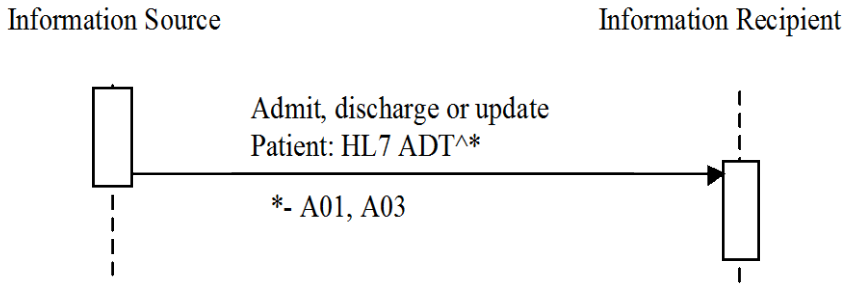


Figure 3.34.4-1: NANIFeed Sequence

3.34.4.1 NANIFeed

The NANIFeed transaction describes the content needed to notify another system of a newborn admission or discharge event. An event notification is used by the receiving system as a workflow triggering event.

3.34.4.1.1 Trigger Events

To provide an event notification for any of the following events, the Information Source will initiate a NANIFeed message for the corresponding event:

A01 – Admission of a patient

A03 – Discharge of a patient

The Information Source SHALL generate the message whenever a Newborn is admitted at birth or discharged from a birth encounter. Definition of Newborn admission follows jurisdictionally defined guidelines, for example, a “birth admit event” may be defined as an admission within 72 hours of the time of birth. It is often expressed as a relationship between the date and time of birth and the date and time of the admission.

Support for the Admission event is required. Support for the additional event types MAY be used to support workflow trigger requirements of the Information Recipient.

3.34.4.1.2 Message Semantics

The NANIFeed transaction is defined in the subsequent sections.

Message segments and their optionality are defined below and their detailed descriptions are provided in the subsections that follow. Segments that are optional in the base HL7 ADT message standard and not utilized in the NANIFeed transaction are not shown in the tables below.

In tables below, segments where the optionality is further constrained for the NANIFeed transaction are shown using the R2 and R+ conventions defined in IHE ITI TF-2x: Appendix C and C.1, i.e.,

R2 - This is an IHE extension. If the sending application has data for the field, it is required to populate the field. If the value is not known, the field may not be sent.

R+ - This is an IHE extension. This is a field that IHE requires, that was listed as optional within the HL7 standard.

Table 3.34.4.1.2-1: ADT^A01 and ADT^A03 Patient Administration Messages

ADT	Patient Administration Message	Optionality	Chapter in HL7 2.3.1
MSH	Message Header	R	3
EVN	Event Type	R	3
PID	Patient Identification	R	3
NK1	Next of Kin / Associated Parties	R2	3
PV1	Patient Visit	R	3

3.34.4.1.2.1 MSH Segment

The MSH segment shall be constructed as defined in ITI TF-2x: C.2.2 “Message Control”.

(MSH-9) Field *MSH-9 Message Type* shall have at least two components. The first component shall have a value of **ADT**; the second component shall be **A01 or A03** as appropriate. The third component is optional; however, if present, it shall have the following value for each corresponding message type:

ADT_A01 for A01 message type

ADT_A03 for A03 message type

3.34.4.1.2.2 EVN Segment

The EVN segment shall be constructed by the Information Source as defined in ITI TF-2x: C.2.4 “Common Segment Definitions”.

Two date/time fields are specified in the EVN segments:

(EVN-2) Recorded Date/Time (R) – the time the admission (birth) (A01) or discharge (A03) was recorded.

(EVN-6) Event Occurred (R2) – the actual time of admission (A01), or the actual time of the discharge (A03).

3.34.4.1.2.3 PID Segment

The PID segment shall be constructed by the Information Source as defined in HL7 V2.3.1 Chapter 3.3.

When sending ADT message A01 or A03, the Information Source shall populate appropriate values in the fields as listed in Table 3.34.4.1.2.3-1.

Table 3.34.4.1.2.3-1: IHE Profile - PID segment

SEQ	LEN	DT	OPT	TBL#	ITEM#	ELEMENT NAME
3	250[Note2]	CX	R		00106	Patient Identifier List
5	250[Note2]	XPN	R		00108	Patient Name
6	250[Note2]	XPN	R2		00109	Mother's Maiden Name
7	26	TS	R+		00110	Date/Time of Birth
8	1	IS	R+	0001	00111	Administrative Sex
11	250[Note2]	XAD	R2		00114	Patient Address
13	250[Note2]	XTN	R2		00116	Phone Number - Home
21	250[Note2]	CX	R2		00124	Mother's Identifier
23	250 [Note2]	ST	O		00126	Birth Place
24	1	ID	R2	0136	00127	Multiple Birth Indicator
25	2	NM	R2		00128	Birth Order
29	26	TS	R2		00740	Patient Death Date and Time
30	1	ID	R2	0136	00741	Patient Death Indicator

Note 1: This table identifies the attributes required to be handled by the Information Recipient. It is likely that not all attributes marked as O or R2 will be sent in some environments by the Information Source.

Note 2: The Data Type and field length of many attributes in this table differ from the requirements stated in HL7 2.3.1. The Information Recipient is required to support these extended lengths to cope with the information it needs to complete identifier cross-referencing logic. The Information Source may or may not send values of the full length listed in this table.

(PID-3) The Information Source shall provide the patient identifier in the ID component (first component) of the PID-3 field (PID-3.1). The Information Source shall use component PID-3.4 to convey the assigning authority (Patient Identification Domain) of the patient identifier. Either the first subcomponent (namespace ID) or the second and third subcomponents (universal ID and universal ID type) shall be populated. If all three subcomponents are populated, the first subcomponent shall reference the same entity as is referenced by the second and third components.

(PID-7) Shall be accurate to at least the day (YYYYMMDD).

(PID-23) Birth Place may be included if relevant for the use case or Realm. Realm-specific implementation guidance may require a specific value set for the allowable concepts to be populated in this string.

3.34.4.1.2.4 PV1 Segment

The PV1 segment shall be constructed by the Information Source as defined in HL7 V2.3.1 Chapter 3.3 for A01 and A03.

The NANIFeed message is required to include the following attributes within the PV1 segment beyond what is specified in the HL7 standard:

Table 3.34.4.1.2.4-1: A01 – PV1 segment

SEQ	LEN	DT	OPT	TBL#	ITEM#	ELEMENT NAME
2	1	IS	R			Patient Class
4	2	IS	R2	0007		Admission Type
7	250[Note2]	XCN	R2			Attending Doctor
19	250[Note2]	CX	R+			Visit Number
42	80	PL	R2			Pending Location
44	26	TS	R+			Admission Date and Time

Note 1: This table identifies the attributes required to be handled by the Information Recipient. It is likely that not all attributes marked as O or R2 will be sent in some environments by the Information Source.

Note 2: The Data Type and field length of many attributes in this table differ from the requirements stated in HL7 2.3.1. The Information Recipient is required to support these extended lengths to cope with the information it needs to complete identifier cross-referencing logic. The Information Source may or may not send values of the full length listed in this table.

Table 3.34.4.1.2.4-2: A03 – PV1 segment

SEQ	LEN	DT	OPT	TBL#	ITEM#	ELEMENT NAME
2	1	IS	R			Patient Class
4	2	IS	R2	0007		Admission Type
7	250[Note2]		R2			Attending Doctor
19	250[Note2]	CX	R+			Visit Number
42	80	PL	R2			Pending Location
44	26	TS	R2			Admission Date and Time
45	26	TS	R+			Discharge Date and Time

Note 1: This table identifies the attributes required to be handled by the Information Recipient. It is likely that not all attributes marked as O or R2 will be sent in some environments by the Information Source.

Note 2: The Data Type and field length of many attributes in this table differ from the requirements stated in HL7 2.3.1. The Information Recipient is required to support these extended lengths to cope with the information it needs to

complete identifier cross-referencing logic. The Information Source may or may not send values of the full length listed in this table.

(PV1-4) The Admission Type SHALL be valued with "N" to indicate a newborn

(PV1-19) The Visit Number SHALL be used to identify the encounter within which services were delivered. For tracking Newborn hearing screening results, process quality measures consider if hearing screening was performed before discharge from the Newborn's birth encounter.

(PV1-42) The Pending Location, if known, SHALL be populated. In an A01 message, it may indicate if the newborn is going to be sent to the NICU. In an A03 message, it may indicate if the baby is going home or to another hospital.

(PV1-44) The Admission Date/Time SHALL be valued with the date and time of discharge in an A01 message.

(PV1-45) The Discharge Date/Time SHALL be valued with the date and time of discharge in an A03 message.

3.34.4.1.2.5 NK1 Segment

The NK1 segment shall be constructed by the Information Source as defined in HL7 V2.3.1 Chapter 3.3.

The NK1 segment contains information about the patient's other related parties. Any associated parties may be identified. Utilizing NK1-1-set ID, multiple NK1 segments can be sent to patient accounts. If a person or organization fulfills multiple contact roles, for example, a person is an emergency contact and a next of kin, it is recommended to send a NK1 segment for each contact role (field 7).

Admission Information Source SHALL populate NK1 segment when next of kin information is available. Newborn Admission Notification Manager SHALL have the ability to accept and process this segment.

This message SHALL send all available relationships in NK1 segments.

When sending A01 and A03 messages the Admission Information Source shall populate appropriate values in the fields as listed in Table 3.34.4.1.2.5-1:

Table 3.34.4.1.2.5-1: IHE Profile – NK1 segment

SEQ	LEN	DT	OPT	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R		190	Set ID - NK1
2	48	XPN	R2		191	Name
3	60	CE	R2	63	192	Relationship
4	106	XAD	R2		193	Address

SEQ	LEN	DT	OPT	TBL#	ITEM#	ELEMENT NAME
5	40	XTN	R2		194	Phone Number
7	60	CE	O	131	196	Contact Role
15	1	IS	O	1	111	Sex
16	26	TS	R2		110	Date/Time of Birth
33	32	CX	R2		751	Next of Kin/Associated Party's Identifiers

Note 1: This table identifies the attributes required to be handled by the Information Recipient. It is likely that not all attributes marked as O or R2 will be sent in some environments by the Information Source.

(NK1-3) At least one repetition of NK1 segment SHOULD have a value of "MTH" in the field NK1-3.1. Other subfields in NK1-3 field are optional.

(NK1-33) If mother's identifier is populated in NK1-33, it SHALL be same as indicated in PID-21.

3.34.4.1.3 Expected Actions – Information Recipient

The Information Recipient SHALL be able to accept and process the message. The method of processing is application specific and not defined by IHE.

Information Receiver SHALL be capable of filtering the A01 and A03 messages to identify when it is associated with birth encounter admission and discharge. The Information Receiver when acknowledging the message SHALL indicate when a message received does not match the filtering for birth encounters.

Each message SHALL be acknowledged by the HL7 ACK message sent by the receiver of ADT messages to the sender. See IHE ITI TF-2x: C.2.3, "Acknowledgement Modes", for definition and discussion of the ACK message.

- If the value in MSA-1 Acknowledgment Code is CA (Commit Accept), the Information Source system SHOULD interpret this to mean the uniquely identified message has been received and that it must not automatically resend the same message.
- If the value in MSA-1 Acknowledgment Code is CE (Commit Error), the Information Source system should examine the warning(s) reported in the ERR segment and take steps to correct them.
- If the value in MSA 1 Acknowledgment Code is CR (Commit Reject), the Information Source should examine the cause(s) reported in the ERR segment and take steps to correct them. If the appropriate action is to retransmit the contents, the Information Source SHALL use a new Message Control ID for the message it resends.

3.34.4.1.3.1 Required Information Recipient Configuration

The following items are expected to be parameters that are configurable on the Information Recipient. For each communication connection between an Information Source and Information Recipient:

Identifier of the Domain. This identifier shall specify all 3 components of the HL7 assigning authority (including the namespace ID and/or both the universal ID and universal ID type subcomponents) of the PID-3 field for the identification of the domain.

Identifier of the Information Source for the domain. This is expected to be the MSH-3 Sending Application and the corresponding MSH-4 Sending Facility fields in the HL7 ADT message. (Alternative identification schemes might include IP address of the Information Source (or Node Authentication if the Audit Trail and Node Authentication Integration Profile is used).

3.34.5 Security Considerations

3.34.5.1 Audit Record Considerations

The NANIFeed transaction, including admission (A01) and discharge (A03) events are audited as a "Patient-record-event" events, as defined in ITI TF-2b: Table 3.20.4.1.1.1-1.

3.34.5.1.1 Information Source Actor audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/ EventIdentification**	EventID	M	EV(110110, DCM, "Patient Record")
	EventActionCode	M	"C" (create) for A01 "U" (update) for A03
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("QRPH-34", "IHE Transactions", "NANIFeed")
Source (Information Source Actor) (1)			
Human Requestor (0..n)			
Destination (Information Recipient Actor) (1)			
Audit Source (Information Source Actor) (1)			
Patient (1)			

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	M	The identity of the Information Source, facility and sending application from the HL7 message; concatenated together, separated by the | character.
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Human Requestor (if known) **AuditMessage/ ActiveParticipant**	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
	NetworkAccessPointID	NA	

Destination **AuditMessage/ ActiveParticipant**	UserID	M	The identity of the Information Recipient, facility and receiving application from the HL7 message; concatenated together, separated by the | character.
	AlternativeUserID	*M*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address.

775

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AuditMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	*M*	*not specialized*
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	the patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=MSH-10 (the literal string), Value=the value of MSH-10 (from the message content, base64 encoded)

780

3.34.5.1.2 Information Recipient audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/ EventIdentification**	EventID	M	EV(110110, DCM, "Patient Record")
	EventActionCode	M	"C" (create) for A01 "U" (update) for A03
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("QRPH-34", "IHE Transactions", "NANIFeed")
Source (Information Source Actor) (1)			
Destination (Information Recipient Actor) (1)			
Audit Source (Information Recipient Actor) (1)			
Patient(1)			

Where:

Source **AuditMessage/ ActiveParticipant**	UserID	M	The identity of the Information Source, facility and sending application from the HL7 message; concatenated together, separated by the | character.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address.

785

Destination **AuditMessage/ ActiveParticipant**	UserID	M	The identity of the Information Recipient, facility and receiving application from the HL7 message; concatenated together, separated by the | character.
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*U*	*not specialized*
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address.

Audit Source **AuditMessage/ AuditSourceIdentification**	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient **(AuditMessage/ ParticipantObjectIdentification)**	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	not specialized
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	the patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=MSH-10 (the literal string), Value=the value of MSH-10 (from the message content, base64 encoded)

Namespace Additions

Add the following terms to the IHE Namespace:

Profile	Format Code	Media Type	Template ID
NONE			

Volume 4 – National Extensions

Add appropriate country section

4 National Extensions

4.R1 National Extensions for US Realm

4.R1.1 Comment Submission

This national extension document was authored under the sponsorship and supervision of HIMSS, RSNA, who welcome comments on this document and the IHE USA initiative. Comments should be directed to:

IHE USA, Secretariat

Email: iheusa@himss.org

4.R1.2 Newborn Admission Notification Information (NANI)

The table below replaces the corresponding table (same number) in Volume 2.

Table 3.34.4.1.2.3-1: IHE Profile - PID segment (US Realm)

SEQ	LEN	DT	OPT	TBL #	ITEM #	ELEMENT NAME
1	4	SI	O		00104	Set ID - Patient ID
2	20	CX	O		00105	Patient ID
3	250 Note2	CX	R		00106	Patient Identifier List
4	20	CX	O		00107	Alternate Patient ID
5	250 Note2	XPN	R		00108	Patient Name
6	250 Note2	XPN	R2		00109	Mother's Maiden Name
7	26	TS	R+		00110	Date/Time of Birth
8	1	IS	R+	0001	00111	Administrative Sex
9	250 Note2	XPN	O		00112	Patient Alias
10	250 Note2	CE	R2 Note 4	0005	00113	Race
11	250 Note2	XAD	R2		00114	Patient Address
12	4	IS	O	0289	00115	County Code
13	250 Note2	XTN	R2		00116	Phone Number - Home
14	250 Note2	XTN	R2		00117	Phone Number - Business
15	250 Note2	CE	O	0296	00118	Primary Language
16	250 Note2	CE	O	0002	00119	Marital Status

SEQ	LEN	DT	OPT	TBL #	ITEM #	ELEMENT NAME
17	250 Note2	CE	O	0006	00120	Religion
18	250 Note2	CX	O		00121	Patient Account Number
19	16	ST	R2		00122	SSN Number – Patient
20	25	DLN	R2		00123	Driver's License Number - Patient
21	250 Note2	CX	R2		00124	Mother's Identifier
22	250 Note2	CE	R2 Note 5	0189	00125	Ethnic Group
23	250 Note2	ST	O		00126	Birth Place
24	1	ID	R2	0136	00127	Multiple Birth Indicator
25	2	NM	R2		00128	Birth Order
26	250 Note2	CE	O	0171	00129	Citizenship
27	250 Note2	CE	O	0172	00130	Veterans Military Status
28	250 Note2	CE	O	0212	00739	Nationality
29	26	TS	R2		00740	Patient Death Date and Time
30	1	ID	R2	0136	00741	Patient Death Indicator

Adapted from the HL7 standard, Version 2.3.1

Note 1: This table defines the attributes required to be handled by the Information Recipient. It is likely that not all attributes marked as R2 or R+ will be sent in some environments by the Information Source.

Note 2: The field length of many attributes in this table exceeds the requirements stated in HL7 2.3.1. The Information Recipient is required to support these extended lengths to cope with the information it needs to complete identifier cross-referencing logic. The Information Source may or may not send values of the full length listed in this table.

Note 3: Bolding in this table indicates an attribute where the optionality differs from the optionality in the HL7 ADT message.

Note 4: Race constraint is tightened to R2 in the US Realm message content module.

Note 5: Ethnic Group is tightened to R2 in the US Realm message content module.