New York City
Department of Health and Mental Hygiene
Citywide Immunization Registry

CIR HL7 Web Service
Local Implementation Guide
For HL7 2.5.1 Immunization Messaging

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Document Version History

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1.1	Regina Austin	02/07/2013	Minor update to Appendix C; modified the NYC DOHMH website URL that should be used to download the soapUI tool and project file.
1.2	Regina Austin	10/28/2015	Update to the WSDL URLs in the Section 1.2 (Introduction, CIR HL7 Web Service Operations) of the IG. Update to the screen shots in Appendix C to reflect new URLs.
1.3	Regina Austin	08/15/2016	VXU support added for: • NPI numbers in ORC-12 • Email address and cell phone number in PID-13 and NK1-5 • Both alpha and numeric ethnicity codes in PID-22.1 • Reporting disease immunity (including history of disease with presumed immunity and serological evidence of immunity) Update to the URLs in Appendix C for Connectivity Test (Steps 1 & 2)
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The CIR HL7 Web Service Local Implementation Guide for HL7 2.5.1 Immunization Messages was developed and updated by HLN Consulting, LLC on behalf of NYC DOHMH.

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1. Introduction

Citywide Immunization Registry

The New York City (NYC) Department of Health and Mental Hygiene's (DOHMH) Citywide Immunization Registry (CIR) is an electronic resource which captures and consolidates demographic and immunization records for individuals in NYC. Immunization records for individuals aged 18 and under are required to be reported to the CIR by all healthcare providers in NYC. Immunization records for individuals 19 years of age and older should be reported to the CIR when the patient gives consent (oral or written) for the report. COVID and other vaccinations with a public health emergency order are required to be reported for all ages with or without consent. Providers may report these immunizations to the CIR in three ways – by using the Online Registry (OR) web application, by submitting an electronic flat file (UPIF format), and by utilizing the CIR HL7 Web Service to perform real-time, bi-directional data exchange with the CIR via HL7 messages.

CIR Security Information

- **Encryption Details**
  Data in transit is secured via TLS. Backups at rest are AES-256 encrypted.
  The database connection is AES-256 encrypted. We require TLS version 1.2 protocol.

CIR HL7 Web Service Operations

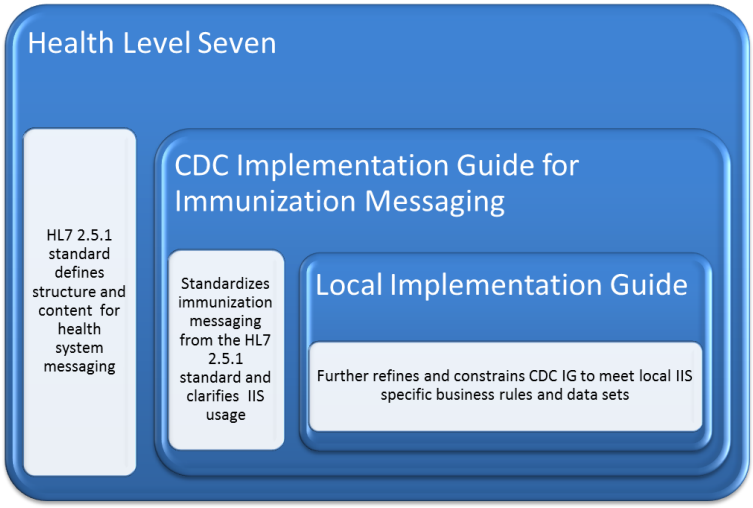
The CIR HL7 Web Service is a collection of four separate operations that can be utilized by HL7 data exchanges partners. The names of the operations and their purposes are listed below.

- **Web Services Description Language (WSDL) Operation**
  - The Web Services Description Language operation returns the WSDL definition for the CIR HL7 Web Service and all the operations that it supports.
  - For 2.5.1 messages, the CIR HL7 Web Service utilizes the national standard WSDL approved by the EHR-IIS Interoperability Expert Panel Project
    - Additional information about the EHR-IIS Expert Panel Project can be found at: http://www.cdc.gov/vaccines/programs/iis/interop-proj/ehr.html
    - For a copy of and additional information about the WSDL go to: http://www.cdc.gov/vaccines/programs/iis/technical-guidance/SOAP/wsdl.html
  - **For UAT (the test environment), use this URL to get to the WSDL:** https://immunize.nyc/hl7-service-uat/services/CirService?wsdl
  - **For Production, use this URL to get to the WSDL:** https://immunize.nyc/hl7-service-prod/services/CirService?wsdl
- **connectivityTest**
  - The purpose of this operation is to test connectivity. It allows the calling system to verify they can connect to the CIR HL7 Web Service.
  - **Before developing or modifying software, we recommend HL7 Data Exchange Partners to usesoapUI for initial connectivity testing.** Connectivity testing will allow an HL7 Data Exchange Partner to confirm they can access the CIR HL7 Web Service or, if not, to more easily identify and correct problems. Instructions for using soapUI are provided in Appendix C of this IG.
- **submitSingleMessage**
  - This operation is used for submitting a 2.5.1 VXU (Unsolicited Vaccine Record Update) message and receiving an ACK (Acknowledge) message in response.

- This operation is also used for submitting a 2.5.1 QBP (Query by Parameter) message and receiving an RSP (Query Response) message or ACK (Acknowledge) message in response.

The generic term "CIR HL7 Web Service" is utilized throughout this document in place of the more specific names of the individual operations. However, it should always be clear from the context which operation is being discussed. Although the operations share some common infrastructure and attributes, such as security and authentication, there is no generic "CIR HL7 Web Service" operation. The CIR HL7 Web Service's functionality is limited to the operations listed above. The bulk of this document describes the submitSingleMessage operation and the messages that this operation processes.

HL7 Implementation Guides



For different health information systems to exchange data, the structure and content of the data to be exchanged must be standardized. Three controlling documents define how the CIR HL7 Web Service data exchange interface works. They are arranged in a hierarchy of documents, each refining and constraining the HL7 Standard.

The first document is the HL7 2.5.1 standard developed by Health Level Seven, a not-for-profit ANSI-accredited standards developing organization. This standard defines the structure and content of immunization messages but leaves many specific implementation details undecided. Beneficial information on HL7 and a copy of the HL7 message standard can be obtained from the Health Level Seven website at http://www.hl7.org.

The second document is the CDC's **HL7 2.5.1 Implementation Guide for Immunization Messaging, Release 1.5** (CDC IG). This guide gives specific instructions regarding how to report to immunization information systems, but still leaves some implementation decisions to each IIS. The CDC IG and other technical information can be obtained from the CDC website at http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html.

The third document is this document. It finalizes all implementation decisions and defines exactly what the CIR HL7 Web Service will and will not accept. It is written in accordance with the standards set in the first two documents. In cases where differences exist between this guide and the CDC IG the differences will be clearly defined in the appropriate sections of this guide. Providing this information allows HL7 Data Exchange Partners to accurately compare the CDC IG with a local implementation guide. Comparing differences between two different local implementation guides will also be much easier than in the past.

Intended Audience

This local IG is intended for technical groups from IIS and Electronic Health Record (EHR) vendors that must implement these guidelines. These individuals and their organizations are collectively referred to as the CIR's HL7 Data Exchange Partners. The reader of this Local IG should have a solid HL7 foundation and be very familiar with the contents of the CDC IG. Chapters 2 and 3 of the CDC IG provide HL7 foundational concepts and set the stage for this Local IG. The goal of this Local IG is to provide an unambiguous specification for creating and interpreting messages.

HL7 Web Service Dashboard

To review data submitted via the HL7 web service, a HL7 Data Quality Dashboard can be accessed in the CIR's Online Registry (https://www.nyc.gov/site/doh/providers/reporting-and-services/cir-security-admin-info.page). This dashboard consists of charts, graphs, and tables based on site-specific Electronic Health Record (EHR) reporting to the CIR via the HL7 web service. It is divided into three pages as described below:

1. **Home Page:** high-level submission trends, including message counts, date of first and most recently submitted report, and querying messages
2. **Data Quality**: data completeness, timeliness of submissions, and accuracy (e.g., missing race/ethnicity values)
3. **HL7 Errors:** details on both fatal and non-fatal errors

Providers can use this dashboard to follow their site(s) as they interact with the HL7 web service. The tools are intended to help facilities stay informed of their reporting efforts, gain insights about their data trends, and take steps to improve data quality. Ultimately, these efforts will support the NYC Department of Health and Mental Hygiene in monitoring the health of New York City's residents.
Providers will maintain individual user accounts to access the dashboard within Online Registry (https://www.nyc.gov/site/doh/providers/reporting-and-services/cir-security-admin-info.page), in addition to any accounts set up via the HL7 web service.

2. HL7 Data Types

Data Type	Data Type Name
CE	Coded element
CE_TX	Text only CE data type
CQ	Composite Quantity with Units
CWE	Coded with Exceptions
CX	Extended Composite Id with Check digit
*DT	Date
*DT_D	Date with precision to day
*DTM	Date/Time
EI	Entity Identifier
ERL	Error Location
FN	Family Name
FT	Formatted text
HD	Hierarchic Designator
ID	Coded Values for HL7 Tables
IS	Coded value for User-Defined Tables
LA2	Location with address variation 2
MSG	Message Type
NM	Numeric
PT	Processing Type
SAD	Street Address
SI	Sequence ID
ST	String
*TS	Time Stamp
*TS_M	Time Stamp with optional precision to the day and no time zone
*TS_NZ	Time Stamp with precision to the day and no time zone
*TS_Z	Time Stamp requiring time zone
VID	Version Identifier
XAD	Extended Address
XCN	Extended Composite ID Number and Name for Persons
XON	Extended Name and Id Number for Organizations
XPN	Extended Person Name
XPN_M	Extended Person Name (Maiden Name)
XTN	Extended telephone number

*See date/time data type definitions below

DATE/TIME/ DATA TYPE FIELDS:		
DATA TYPE	**Data Type Name**	**DETAILS**
DT	**Century And Year With Optional Precision To Month And Day**	YYYY[MM[DD]] FOUR DIGITS TO SPECIFY PRECISION OF YEAR SIX DIGITS TO SPECIFY PRECISION OF MONTH EIGHT DIGITS TO SPECIFY PRECISION OF DAY
DT_D	**Date With Precision To Month And Day**	MUST BE 8 DIGITS The Precision of this DT_D data type has the following constraints. YYYY → REQUIRED MM→ REQUIRED DD→ REQUIRED NOTE: HH, MM, [SS[.S[S[S[S]]]]], AND +/-ZZZZ → ARE NOT ALLOWED FOR THIS DATA TYPE AND SHALL NOT BE SENT
DTM	**Date/Time**	THE NUMBER OF CHARACTERS POPULATED, EXCLUDING THE TIME ZONE SPECIFICATION, SPECIFIES THE PRECISION FORMAT→ YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ] • Eight are used to specify a precision of "day." the first ten are used to specify a precision of "hour” • the first twelve are used to specify a precision of "minute” • the first fourteen are used to specify a precision of "second” • the first sixteen are used to specify a precision of "one tenth of a second” • the first nineteen are used to specify a precision of " one ten thousandths of a second” When the time zone is not included, it is presumed to be the time zone of the sender. NOTE: THIS DATA TYPE WILL BE CONSTRAINED AT THE FIELD LEVEL, DEPENDING ON THE USE
TS	**Time Stamp**	Definition: Specifies a point in time. TIME→ DTM DATA USAGE TYPE → REQUIRED The DTM component of this Time Stamp has the following constraints YYYY → REQUIRED DEGREE OF PRECISION (ID) → X MM → REQUIRED DD → REQUIRED HH→ OPTIONAL MM → OPTIONAL [SS[.S[S[S[S]]]]] → OPTIONAL +/-ZZZZ → OPTIONAL

DATE/TIME/ DATA TYPE FIELDS:		
DATA TYPE	**Data Type Name**	**DETAILS**
TS_M	**Time Stamp With Optional Precision To The Day And No Time Zone**	Definition: Specifies a point in time. This data type requires a precision to the month. Precision to the day is optional. TIME→ DTM DATA USAGE TYPE → REQUIRED DEGREE OF PRECISION (ID)→ X YYYY→ REQUIRED MM→ REQUIRED DD→ OPTIONAL HH → OPTIONAL MM→ OPTIONAL [SS[.S[S[S[S]]]]] → OPTIONAL +/-ZZZZ → OPTIONAL
TS_NZ	**Time Stamp With Precision To The Day And No Time Zone**	Definition: Specifies a point in time. This data type requires a precision to the day. No Time zone is included TIME→ DTM DATA USAGE TYPE REQUIRED DEGREE OF PRECISION (ID) → X YYYY→ REQUIRED MM→ REQUIRED DD → REQUIRED HH → OPTIONAL MM→ OPTIONAL [SS[.S[S[S[S]]]]] → OPTIONAL +/-ZZZZ → X
TS_Z	**Time Stamp Requiring Time Zone**	Definition: Specifies a point in time. This data type requires a precision to the second and requires that the time zone be included TIME→ DTM DATA USAGE TYPE REQUIRED DEGREE OF PRECISION (ID) → X YYYY→ REQUIRED MM → REQUIRED DD → REQUIRED HH→ REQUIRED MM→ REQUIRED SS→ REQUIRED [SS[.S[S[S[S]]]]] → OPTIONAL +/-ZZZZ → REQUIRED

3. Supported HL7 Message Types

The CIR HL7 Web Service supports two message types: VXU and QBP and their corresponding response messages (ACK and RSP).

The VXU is used by CIR's HL7 Data Exchange Partners to send client data and immunizations to the CIR. The corresponding ACK is used by the CIR HL7 Web Service to acknowledge to the HL7 Data Exchange Partner the results of the CIR HL7 Web Service's efforts to process the VXU.

The QBP is used by CIR's HL7 Data Exchange Partners to Query by Parameter for client and related immunization data. The corresponding RSP is used by the CIR HL7 Web Service to message a response to the HL7 Data Exchange Partner.

It is important to understand some basic concepts which are used throughout tables in this document. For more in-depth details, please refer to the CDC IG.

Concept	Information
[XYZ]	Square Brackets enclose optional segments
{XYZ}	Curly Braces enclose segments which can be repeated
[{XYZ}]	Defines an optional segment which can be repeated.

Concept	Information

Optionality/ Usage	*R – Required*
	• These are required to message with the IIS.
	  ○ Sending application shall populate all "R" elements with a non-empty value.
	  ○ Receiving application shall process or ignore the information conveyed by required elements.
	  ○ Receiving application must not raise an error due to the presence of a required element but may raise an error due to the absence of a required element.
	RE – Required but may be empty
	• If the sending system CAN provide the information, then the sending system must provide the information.
	• If the sending system CANNOT provide the information, then it is acceptable to leave the element empty.
	C – Conditional
	• If the predicate is satisfied, the sending system must send the information.
	• If the predicate is not satisfied, the sending system must not send the information.
	CE – Conditional but may be empty
	• If the predicate is satisfied and the sending system CAN provide the information, then the sending system must send the information.
	• If the predicate is satisfied but the sending system CANNOT provide the information, then it is acceptable to leave the element empty.
	• If the predicate is not satisfied, then the sending system must not send the information
	O – Optional
	• These elements are entirely optional to provide by the sending system and also optional to consume by the IIS.
	X – Not Supported
	• These fields are not supported by the IIS. There should be no anticipation by the sending system that the IIS is consuming these elements.

Cardinality	Indicator of the minimum and maximum number of times the element may appear. [0..0] Element never present. [0..1] Element may be omitted or occur only once. [0..n] Element may be omitted or repeat up to n times. [0..*] Element may be omitted or repeat an unlimited number of times. [1..1] Element must have exactly one occurrence. [1..n] Element must appear at least once and may repeat up to n times. [1..*] Element must appear at least once and may repeat unlimited number of times. [m..n] Element must appear at least m times and may repeat up to n times.
Begin "Named" Group … End "Named" Group	Within a message type grammar table (VXU, RSP), there are groupings which may or may not be required and may or may not repeat. These groupings are further refined by the segments within the group.

The tables that immediately follow show the segments that are used to construct each message. Each segment is one line of text ending with the carriage return character as required by HL7. The full HL7 standard allows additional segments within these message types, but they are unused by the CIR HL7 Web Service. To remain compliant with HL7, their use will not result in an error, but the CIR HL7 Web Service will ignore the content of the additional segments. The segments that are documented here are sufficient to support the principal CIR HL7 Web Service functions related to clients and immunizations.

VXU – Unsolicited Vaccination Update Grammar

Table 3-1 Unsolicited Vaccination Update (VXU)

Segment	Cardinality	Optionality	Comment
MSH	**[1..1]**	**R**	
[{SFT}]	**[0..0]**	**X**	
PID	**[1..1]**	**R**	
[PD1]	**[0..1]**	**RE**	
[{NK1}]	**[0..*]**	**RE**	
[PV1]	**[0..0]**	**X**	
[PV2]	**[0..0]**	**X**	
[GT1]	**[0..0]**	**X**	
{	**[0..0]**	**I**	*Begin Insurance Group* **CIR HL7 Web Service does not support this grouping. If sent, the segments in this grouping will be ignored.**
[IN1]	**[0..0]**	**R**	
[IN2]	**[0..0]**	**X**	
[IN3]	**[0..0]**	**X**	
}			*End Insurance Group*
{	**[0..*]**	**RE**	*Begin Order Group* **Each VXU may have zero or more Order Groups.** **If the VXU contains one or more Order Groups, at least one of those Order Group must be successful (i.e., contain no fatal errors); otherwise, the VXU message will be rejected.**
ORC	**[1..1]**	**R**	**Each RXA requires exactly one ORC**
[TQ1]	**[0..0]**	**X**	
[TQ2]	**[0..0]**	**X**	
RXA	**[1..1]**	**R**	**Each ORC requires exactly one RXA**
[RXR]	**[0..1]**	**RE**	
[{OBX}	**[0..*]**	**RE**	
{NTE}]	**[0..1]**	**X**	
}			*End Order Group*

ACK – Message Acknowledgement Grammar

Table 3-2 Message Acknowledgement (ACK)

Segment	Cardinality	Optionality	Comment
MSH	**[1..1]**	**R**	
[{SFT}]	**[0..0]**	**X**	
MSA	**[1..1]**	**R**	
[{ERR}]	**[0..*]**	**RE**	**If an error (fatal and non-fatal) exists, then this segment is populated. Each error will have its own ERR segment.**

Non-supported segments (Optionality of “X”) will not be returned by the CIR HL7 Web Service.

QBP – Query By Parameter Grammar

The CIR HL7 Web Service supports querying the CIR for a patient's immunization history and immunization recommendations using both Z34 and Z44 profile for QBP messages.

Table 3-3 Query by Parameter (QBP)

Segment	Cardinality	Optionality	Comment
MSH	**[1..1]**	**R**	
[{SFT}]	**[0..0]**	**X**	
QPD	**[1..1]**	**R**	
RCP	**[1..1]**	**R**	
[DSC]	**[0..0]**	**X**	

Non-supported segments (Optionality of "X") will not be returned by the CIR HL7 Web Service.

RSP – Query Response Grammar

The CIR HL7 Web Service only supports the return of an Immunization History – Z32^CDCPHINVS profile and of both Immunization History and Forecast – Z42^CDCPHINVS profile. The CIR HL7 Web Service will not return a list of candidate patients – Z31^CDCPHINVS profile, i.e., will only return a patient's Immunization History for a single 'exact' patient match.

Table 3-4 Response (RSP)

Segment	Cardinality	Optionality	Comment
MSH	**[1..1]**	**R**	
MSA	**[1..1]**	**R**	
[ERR]	**[0..*]**	**RE**	**If an error (fatal and non-fatal) exists, then this segment is populated. Each error will have its own ERR segment. The CIR differs from the CDC IG and does not return only one ERR segment.**
QAK	**[1..1]**	**R**	
QPD	**[1..1]**	**R**	**Query Parameter Definition segment matches the information in the requesting QBP message.**
[	**[0..1]**	**O**	*Begin Response Group* **If a query errors out or if no matching persons are found, the segments in the Response Group will not be returned.**
[	[0..*]	O	***Begin patient identifier Group***
PID	[1..1]	R	Patient identifier data returned in an RSP is limited by the CIR to the patient's name, date of birth, cell phone, home phone, and sex. For new immunizations additional information such as dose amount and unit and facility name of where dose was administered or reported is returned.
[PD1]	[0..0]	X	
[{NK1}]	[0..0]	X	
]			***End Patient Identifier***
[	[0..1]	O	***Begin Immunization History Group***
[PV1]	[0..0]	X	
[IN1]	[0..0]	X	
[{	[0..*]	RE	***Begin Order Group***
ORC	[1..1]	R	
RXA	[1..1]	R	
[RXR]	[0..0]	X	
[{	[0..*]	RE	***Begin Observation Group***
OBX	[1..*]	R	

{NTE}]	[0..0]	X	
}]			***End observation***
}]			***End Order***
]			***End Immunization History***
]			***End Response Group***

Non-supported segments (Optionality of “X”) will not be returned by the CIR HL7 Web Service.

4. Unsolicited Vaccination Update (VXU)

Overview

The CIR HL7 Web Service supports the processing of VXU messages via the SubmitPatientImmRecord operation. This operation takes as input an HL7 formatted VXU message as described in the sections below.

HL7 Data Exchange Partners can utilize VXU messages to report (i.e., add) immunizations to the CIR and to request that the CIR delete immunizations that the partner had previously reported to the CIR. One immunization can be reported or deleted per RXA segment. Each VXU message can have multiple RXA segments.

HL7 Data Exchange Partners must utilize the RXA-21 field of each RXA segment to denote whether that RXA segment's immunization is being added or deleted. When processing a VXU message, the CIR HL7 Web Service first processes all RXA segments that are for deleting an immunization and then processes all RXA segments that are for adding an immunization.

The CIR HL7 Web Service does support requests to update previously reported immunizations where RXA-21 field is a 'U'. HL7 Data Exchange Partners can also effectively perform an update by sending a message that both deletes the previously reported immunization and adds the updated immunization.

While most VXU messages are used to report immunizations, an HL7 Data Exchange Partner can also utilize VXU messages to report (i.e., add) or delete an observation, such as serological evidence of immunity or history of disease as evidence of immunity.

When a VXU message with immunization information is sent to add or delete an immunization or an evidence of immunity observation, the VXU message should contain at least one valid Order Group (i.e., corresponding ORC, RXA, and, when applicable, OBX segment that contains no fatal errors). If ORC and/or RXA is missing, patient demographic information will be added or updated.

If there are errors within an Order Group that make it unclear whether the Order Group is being sent to report/delete *an immunization* or whether the Order Group is being sent to report/delete *an evidence of immunity observation*, the CIR HL Web Service will consider that the Order Group is attempting to report/delete *an immunization* and will return errors accordingly.

Reporting Immunizations

VXU messages are most commonly used to report (i.e., add) immunizations to the CIR. To report an immunization, HL7 Data Exchange Partners should set the value of the RXA-21 field to the HL7 code "A" (for Add). When the CIR HL7 Web Service receives the VXU message, it validates the message, searches for the existing patient (if any), creates a new patient (if none exists), inserts any new immunizations for that patient, and ignores any duplicate immunizations.

Deleting Previously Reported Immunizations

VXU messages can also be used to request that the CIR delete immunizations that the HL7 partner had previously reported to the CIR. HL7 Data Exchange Partners must set the value of the RXA-21 field to the HL7 code "D" (for Delete) to request that the CIR delete a previously reported immunization that matches the patient, the vaccine, and the administration date specified by the RXA segment.

If a matching immunization is found and if that matching immunization had been previously reported by a facility having the same CIR issued facility ID that is specified in RXA-11.4.1 of the VXU message, then the CIR HL7 Web Service will delete the immunization from the CIR database.

If a matching immunization is found but that matching immunization had been previously reported by a facility that is different from the facility that is specified in the RXA-11.4.1 field, then the immunization will not be automatically deleted. Instead, the CIR HL7 Web Service sends an alert to CIR staff that will eventually review the request and then process it if appropriate. When a delete request is under review, the CIR HL7 Web Service will include a "Vaccination_Delete_Under_Review" deletion exception within the ERR segment of the ACK response message. A report has been requested by CIR to capture this information.

If a matching immunization is not found, then the CIR HL7 Web Service ignores the corresponding RXA segment but continues processing any other RXA segments that are a part of that VXU message. The CIR HL7 Web Service will include a "Vaccination_Not_Found" deletion exception within the ERR segment of the ACK response message indicating the immunization was not found and therefore could not be deleted.

Updating Previously Reported Immunizations

HL7 Data Exchange Partners can send VXU message updates where RXA-21 is populated with a 'U'. The CIR processes updates such as when the vaccinator (same administering facility – RXA-11.4) makes an update or when the vaccinator submits the administered vaccine replacing a historical report from another.

HL7 Data Exchange Partners can also effectively perform an update by sending a VXU message that contains both an RXA segment that deletes a previously reported immunization and an RXA segment reporting the immunization that should replace it.

Evidence of Immunity Observations

While most VXU messages are used to report immunizations, an HL7 Data Exchange Partner can also utilize VXU messages to report (i.e., add) or delete an observation, such as serological evidence of immunity or history of disease as evidence of immunity. When reporting evidence of immunity (or requesting that a previously reported immunity observation be deleted), the data exchange partner should send one evidence of immunity observation (i.e., RXA/OBX pair) per Order Group. Each VXU message can have multiple Order Groups each containing an RXA/OBX pair with an evidence of immunity observation. When processing a VXU message, the CIR HL7 Web Service first processes all RXA/OBX pairs that are for deleting an evidence of immunity observation and then processes all RXA/OBX pairs that are for adding an evidence of immunity observation.

HL7 Data Exchange Partners must utilize the RXA-21 field of each RXA segment to denote whether the evidence of immunity observation in the corresponding OBX is being added or deleted. To report an evidence of immunity observation, HL7 Data Exchange Partners should set the value of RXA-21 to the HL7 code "A" (for Add). To request that a previously reported evidence of immunity observation be deleted, HL7 Data Exchange Partners should set the value of RXA-21 to the HL7 code "D" (for Delete).

When a request to delete an evidence of immunity observation is received, the CIR HL7 Web Services looks for a match on the following fields:

- OBX-3: indicates the type of immunity being reported - serological evidence of immunity or history of disease as evidence of immunity
- OBX-5: indicates the disease for which immunity is being reported and if immunity has been established via serological evidence or history of disease.

- OBX-14: indicates the date the disease was diagnosed or the date of the test, depending on the type of immunity being reported
- RXA-11.4.1: indicates the location (CIR facility ID) recording the evidence of immunity observation Refer to the Unsolicited Vaccine Updates (VXU) Chapter within this guide, Section: VXU Segment: RXA.

If a matching evidence of immunity observation is found for that patient and if that matching observation had been previously reported by a facility having the same CIR issued facility ID that is specified in RXA-11.4.1, then the CIR HL7 Web Service will delete the evidence of immunity observation from the CIR database.

If a matching evidence of immunity observation is found but that matching observation had been previously reported by a facility that is different from the facility that is specified in RXA-11.4.1, then the evidence of immunity observation will not be automatically deleted. Instead, the CIR HL7 Web Service sends an alert to CIR staff that will eventually review the request and then process it if appropriate. When a delete request is under review, the CIR HL7 Web Service will include an "DiseaseImmunity_Delete_Under_Review" deletion exception within the ERR segment of the ACK response message.

If a matching immunity observation is not found, then the CIR HL7 Web Service ignores the corresponding RXA/OBX pair requesting the delete but continues processing any other RXA/OBX pairs that are reporting evidence of immunity as part of that VXU message. The CIR HL7 Web Service will include a "DiseaseImmunity_Not_Found" deletion exception within the ERR segment of the ACK response message indicating the observation was not found and therefore could not be deleted.

HL7 Data Exchange Partners can effectively perform an update by sending a VXU message that contains both an RXA/OBX segment pair that deletes previously reported evidence of immunity and an RXA/OBX segment pair reporting the evidence of immunity that should replace it.

Updating Previously Reported Patient Demographic Details

HL7 Data Exchange Partners may update patient demographic details by resubmitting a previously reported vaccination or by submitting an HL7 VXU message with demographic information only. If the HL7 data exchange partner's interface system can support submitting an HL7 VXU message with demographic information only, the HL7 VXU message can contain the PID, PD1 and NK1 segments.

Example:

```
MSH|^~\&|Patients First 3.1|9009Q00|NYC DOHMH|NYC DOHMH|20210223093122-
0500||VXU^V04^VXU_V04|587999438218|T|2.5.1|||NE|AL||||||8000N70|
PID|1||7884089521^^^^LR~M882894^^^8000N70^MR~MC12345M^^^^MA||Mason^Matthew^Thomas^^^^L~^Matt^^^^^A|
Walters^Rebecca^^^^^M|20151015|M||2106-3^White^HL70005|305 Big Apple Blvd&Big Apple Blvd&305^7C^New
York^NY^12345-1234^^P||^PRN^CP^^^927^5551313||ENG^English^HL70296|||||||N^Not Hispanic or
Latino^HL70189|11116|Y|2|
NK1|1|Mason^Rebecca^Ann^^^^L|MTH^Mother^HL70063||^PRN^PH^^^212^5551212~^ORN^CP^^^927^5551313~^NET^X
.400^Rebecca.Mason@isp.com|^WPN^PH^^^212^7771212^497||||||||||19781115|
NK1|2|Mason^Tom^^^^^L|FTH^Father^HL70063||^PRN^PH^^^212^5551212~^ORN^CP^^^927^5551414~^NET^X.400^To
m.Mason@isp.com|^WPN^PH^^^212^3456789^101||||||||||19750725|
```

Reporting Two Doses of CVX Code 307 to CIR

On July 17, 2023, the Food and Drug Administration licensed Nirsevimab (Beyfortus), a long-acting monoclonal antibody for the prevention of respiratory syncytial virus (RSV) in infants and young children. The Beyfortus nirsevimab monoclonal antibody codes are included in the vaccine code set in a manner like regular vaccines to enable reporting or other program data exchange in accordance with ACIP and CDC guidelines.

Providers are now able to report both doses when two 100 mg doses of CVX code 307 are administered on the same day (100 mg is one vial amount). Although nirsevimab is not a vaccine, all doses administered should be reported to the Citywide Immunization Registry (CIR) as a vaccine rather than a medication, including previously administered doses that have not yet been reported. Therefore, EHR vendors should program a reporting mechanism that allows two doses of nirsevimab on the same day to be reported. Below are the examples of how to report two doses for CVX code 307, the Beyfortus nirsevimab monoclonal antibody.

First RSV Dose

```
RXA|0|1|20231218|20231218|307^NIRSEVIMAB-ALIP IM 100MG^CVX^49281-0574-88^NIRSEVIMAB-ALIP IM
100MG^NDC|1|ML||00^New immunization
record^NIP001|^JONES^PAT^^^^^^^^^^^^^^^^^^RN^^^^^^^^OEI|^^^9009X01^^^^^||||2022831|20250301|
PMC^sanofi pasteur^MVX|||CP|A|20231218141849-0500||||||

RXR|IM^Intramuscular^HL70162|LT^Left Thigh^HL70163
```

Second RSV Dose

```
RXA|0|1|20231218|20231218|307^NIRSEVIMAB-ALIP IM 100MG^CVX^49281-0574-88^NIRSEVIMAB-ALIP IM
100MG^NDC|1|ML||00^New immunization
record^NIP001|^JONES^PAT^^^^^^^^^^^^^^^^^^RN^^^^^^^^OEI|^^^9009X01^^^^^||||2022831|20250301|
PMC^sanofi pasteur^MVX|||CP|A|20231218141849-0500||||||

RXR|IM^Intramuscular^HL70162|RT^Right Thigh^HL70163
```

Notes: NYC CIR does not allow the 2nd dose of CVX code 307 on the same day for any patient outside of the age range that is from 8 months to 19 months (<20 months). If a patient is under 8 months old or is 20 months or older, CIR HL7 Web Service will not store the additional dose of CVX code 307 on the same day. It will store only a single dose of CVX code 307. For patients aged 8 months to 19 months (<20 months), up to two doses of CVX code 307 on the same day will be stored in CIR.

VXU Message Segments

MSH—Message Header Segment

MSH is a required segment in a VXU message.

Table 4-1 Message Header Segment (MSH) in a VXU

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Field Separator	ST		[1..1]	[1..1]	R	R
2	Encoding Characters	ST		[1..1]	[1..1]	R	R
3	Sending Application	HD	0361	[0..1]	[0..1]	RE	RE
4	Sending Facility	HD	0362	[0..1]	[1..1]	RE	R
5	Receiving Application	HD	0361	[0..1]	[0..1]	RE	RE
6	Receiving Facility	HD	0362	[0..1]	[0..1]	RE	RE
7	Date/Time Of Message	TS_Z		[1..1]	[1..1]	R	R
8	Security	ST		[0..1]	[0..1]	O	O
9	Message Type	MSG		[1..1]	[1..1]	R	R
10	Message Control ID	ST		[1..1]	[1..1]	R	R
11	Processing ID	PT		[1..1]	[1..1]	R	R
12	Version ID	VID		[1..1]	[1..1]	R	R
13	Sequence Number	NM		[0..1]	[0..0]	O	O
14	Continuation Pointer	ST		[0..1]	[0..0]	O	O
15	Accept Acknowledgement Type	ID	0155	[0..1]	[0..1]	RE	RE
16	Application Acknowledgment Type	ID	0155	[0..1]	[0..1]	RE	RE
17	Country Code	ID	0399	[0..1]	[0..1]	O	O
18	Character Set	ID	0211	[0..1]	[0..1]	O	O
19	Principal Language Of Message	CE		[0..1]	[0..1]	O	O
20	Alternate Character Set Handling Scheme	ID	0356	[0..1]	[0..1]	O	O
21	Message Profile Identifier	EI		[0..*]	[0..*]	O	RE
22	Sending Responsible Organization	XON	0362	[0..1]	[0..1]	RE	RE

MSH Field Usage Notes

MSH-1 Field Separator (ST)

This field contains the separator between the segment ID and the first real field, MSH-2-encoding characters. As such it serves as the separator and defines the character to be used as a separator for the rest of the message. **This is a required field. Required value is |** (ASCII 124).

Example:
MSH|
↑

MSH-2 Encoding Characters (ST)

This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. **This is a required field. Required values are ^~\&** (ASCII 94, 126, 92, and 38, respectively).

Special characters that are utilized within HL7 messages as separators (also referred to as delimiters) should not be included within those same HL7 messages as data because their presence would interfere with the parsing of the message. If an HL7 message does contain one of these special delimiter characters as part of the message content (e.g., an ampersand as part of an address: "Apartment A & B"), then the HL7 data exchange partner must utilize a special escape sequence to indicate that the character is a text character and not a delimiter; otherwise, the CIR HL7 Web Service cannot distinguish between the delimiter character and a character that is part of the text.

In order to include any one of these special characters as data within an HL7 message, those characters must be converted into a predefined sequence of characters that begin and end with the escape character "\". HL7 Data Exchange Partners should utilize the table below to convert special characters into escape sequences when creating outbound messages to the CIR HL7 Web Service and to convert escape sequences to special characters when parsing inbound messages from the CIR HL7 Web Service:

Special Character Description	Special Character	Escape Sequence
Escape character	\	\E\
Field separator	|	\F\
Repetition separator	~	\R\
Component separator	^	\S\
Subcomponent separator	&	\T\

In the example below, the MSH-2 field indicates that "&" is the subcomponent separator so, in the PID-11 address field when representing "Apartment A&B", the "&" has been replaced with the escape sequence "\T\" to indicate that "&" is part of the message text, rather than a subcomponent separator:

MSH|^~**&**|EMR 1.1|8000N70|||20121010153122-0400||VXU^V04^VXU_V04|587999|P|2.5.1|||NE|AL|

PID|1||675815087^^^^LR~Smith221^^^^MR||Smith^^Tom^^^^L||20081015|M|||100 Main Street&Main Street&100^ **Apartment A\T\B** ^New York^NY^12345-1234^^P|

MSH-3 Sending Application (HD)

This field uniquely identifies the sending application. This is not the product, but rather the name of the specific instance.

The CIR HL7 Web Service will not maintain a list of IIS applications in user-defined table 0300 and, therefore, will not limit MSH-3.1 values to the table 0300 value set.

The HL7 data exchange partner should value MSH-3.1 with the name of the sending application followed by the software version.

Example:
MSH|^~\&|**Patients First 1.1**|

MSH-4 Sending Facility (HD)

This field identifies the organization responsible for the operations of the sending application. **This is a required field.**

The HL7 data exchange partner should value MSH-4.1 with the Facility Code that was assigned by the NYC DOHMH. The value in MSH-4.1 should be the same as the Facility Code associated with the HL7 account sending the message.

If the Facility Code is not valid or does not match the Facility Code that is associated with the HL7 account that was used to connect to the CIR HL7 Web Service, it will be considered a fatal error.

The CIR HL7 Web Service will not maintain a list of facility codes in user-defined table 0300 and, therefore, will not limit MSH-4.1 values to the table 0300 value set.

The CIR HL7 Web Service also supports sending of Sending Responsible Organization in MSH-4.2. The HL7 Web Service will only process MSH-4.2 if MSH-22 is not populated or contains an invalid value.

The HL7 data exchange partners should value MSH-4.2 with a Facility Code that was assigned by the NYCDOHMH. If the Facility Code is not valued or not valid, the CIR HL7 Web Service shall ignore the MSH-4.2 segment.

MSH-5 Receiving Application (HD)

This field uniquely identifies the receiving application. We recommend populating this field with “NYC DOHMH”. However, this field will be ignored if sent as part of a VXU.

MSH-6 Receiving Facility (HD)

This field identifies the organization responsible for the operations of the receiving application. We recommend populating this field with “NYC DOHMH”. However, this field will be ignored if sent as part of a VXU.

MSH-7 Date/Time of Message (TS_Z)

This is the date and time that the sending system created the message. **This is a required field.**

The degree of precision should be to the second. The time zone must be specified and will be used throughout the message as the default time zone.

> The time zone was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

Additional precision, if sent, will be ignored. If the Date Time of Message is not sent or is invalid (i.e., not a valid date or not in the correct format), a fatal error will be reported.

The expected format is YYYYMMDDHHMMSS-ZZZZ

Example:
|**20120204030159-0500**|
This represents February 4, 2012, at 3:01:59 Eastern Standard Time (EST).

Example:
|**20120710061152-0400**|
This represents July 10, 2012, at 06:11:52 Eastern Daylight Savings Time (EDT).

When a VXU is sent to report evidence of immunity, the date provided in MSH-7 will also be used to record the date the observation was reported to the CIR.

MSH-9 Message Type (MSG)

This field contains the message type, trigger event, and the message structure ID for the message. **All three components are required.**

When sending a VXU, **MSH-9 must contain: |VXU^V04^VXU_V04|**

All other values will be considered a fatal error.

If MSH-9 is not valued or is valued with other than the expected message type and trigger event the message cannot be parsed and, therefore, will be rejected as an improperly formatted message.

> The third component, message structure ID (MSH-9.3) was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

MSH-10 Message Control ID (ST)

This field contains the identifier assigned by the sending application (MSH.3) that uniquely identifies a message instance. This identifier is unique within the scope of the sending facility (MSH.4), sending application (MSH.3), and the YYYYMMDD portion of message date (MSH.7). **This is a required field.**

The CIR HL7 Web Service will echo this ID back to the HL7 Data Exchange Partner in the Message acknowledgment segment (MSA) of the ACK response message.

MSH-11 Processing ID (PT)

This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules. **This is a required field.** Use “P” for Production and “T” for Testing, all other values will be considered a fatal error. Also, if “P” is sent for a Test message or “T” is sent for a Production message, it will be considered a fatal error.

MSH-12 Version ID (VID)

This field contains the identifier of the version of the HL7 messaging standard used in constructing, interpreting, and validating the message. **This is a required field.** Only the first component need be populated. When sending a 2.5.1 message, **value MSH-12 with “2.5.1”**.

> The only versions of HL7 that the CIR HL7 Web Service has been tested with and officially supports are 2.3.1 and 2.5.1. The CIR HL7 Web Service will reject any message that has a Version ID (MSH-12 value) other than 2.3.1 or 2.5.1.

MSH-15 Accept Acknowledgment Type (ID)

This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message. The expected value is “NE”.

The CIR HL7 Web Service never sends an (accept) acknowledgement when the message is received; it only sends an (application) acknowledgement once it has processed the message.

If MSH-15 is blank or contains a value other than “NE” (Never) type, MSH-15 will be treated as if “NE” was sent, and no error will be reported.

MSH-16 Application Acknowledgment Type (ID)

This field contains the conditions under which application acknowledgments are required to be returned in response to this message. The expected value is “AL”.

The CIR HL7 Web Service will always send an acknowledgement once it has processed the VXU message.

If MSH-16 is blank or contains a value other than “AL” (Always) type, MSH-16 will be treated as if “AL” was sent, and no error will be reported.

MSH-21 Message Profile Identifier (EI)

This field is used to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.

The CIR HL7 Web Service accepts this field in VXU messages. This field will be used in QPD messages to reference query profile Z34^CDCPHINVS.

MSH-22 Sending Responsible Organization (XON)

This field identifies the business organization that originated and is accountable for the content of the message.

The HL7 data exchange partner should value MSH-22 with a Facility Code that was assigned by the NYC DOHMH. If the Facility Code is not valid, the CIR HL7 Web Service will return a non-fatal error. The CIR HL7 Web Service will not return a non-fatal error if the field is left blank.

If MSH-22 is not populated, the HL7 Web Service will look at MSH-4.2 for Sending Responsible Organization.

SFT—Software Segment

If present, the entire SFT segment is ignored by the CIR HL7 Web Service.

PID—Patient Identifier Segment

PID is a required segment in a VXU message.

The PID segment is used as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Table 4-2 Patient Identifier Segment (PID) in a VXU

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Set ID - PID	SI		[0..1]	[0..1]	RE	RE
2	Patient ID	CX		[0..0]	[0..0]	X	X
3	Patient Identifier List	CX		[1..*]	[1..*]	R	RE
4	Alternate Patient ID	CX		[0..0]	[0..0]	X	X
5	Patient Name	XPN		[1..*]	[1..2]	R	R
6	Mother’s Maiden Name	XPN		[0..1]	[0..1]	RE	RE
7	Date/Time of Birth	TS_NZ		[1..1]	[1..1]	R	R

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
8	Administrative Sex	IS	0001	[0..1]	[1..1]	RE	RE
9	Patient Alias	XPN		[0..0]	[0..0]	X	X
10	Race	CE	0005	[0..*]	[0..1]	RE	RE
11	Patient Address	XAD		[0..*]	[0..1]	RE	RE
12	County Code	IS	0289	[0..0]	[0..0]	X	X
13	Phone Number - Home	XTN		[0..*]	[0..*]	RE	RE
14	Phone Number - Business	XTN		[0..*]	[0..0]	O	O
15	Primary Language	CE	ISO 0639	[0..1]	[0..1]	O	O
16	Marital Status	CE	0002	[0..1]	[0..1]	O	O
17	Religion	CE	0006	[0..1]	[0..1]	O	O
18	Patient Account Number	CX		[0..1]	[0..1]	O	O
19	SSN Number - Patient	ST		[0..0]	[0..0]	X	X
20	Driver's License Number - Patient	DLN		[0..0]	[0..0]	X	X
21	Mother's Identifier	CX		[0..0]	[0..0]	X	X
22	Ethnic Group	CE	0189	[0..1]	[0..1]	RE	RE
23	Birth Place	ST		[0..1]	[0..1]	O	O
24	Multiple Birth Indicator	ID	0136	[0..1]	[0..1]	RE	RE
25	Birth Order	NM		[0..1]	[0..1]	O	C(RE/O)
26	Citizenship	CE	0171	[0..1]	[0..1]	O	X
27	Veterans Military Status	CE	0172	[0..1]	[0..1]	O	X
28	Nationality	CE	0212	[0..1]	[0..1]	O	X
29	Patient Death Date and Time	TS		[0..1]	[0..1]	RE	RE
30	Patient Death Indicator	ID	0136	[0..1]	[0..1]	O	C(RE/O)
31	Identity Unknown Indicator	ID	0136	[0..1]	[0..1]	O	O
32	Identity Reliability Code	IS	0445	[0..1]	[0..1]	O	O
33	Last Update Date/Time	TS		[0..1]	[0..1]	O	O
34	Last Update Facility	HD		[0..1]	[0..1]	O	O
35	Species Code	CE	0446	[0..1]	[0..1]	O	O
36	Breed Code	CE	0447	[0..1]	[0..1]	O	O
37	Strain	ST		[0..1]	[0..1]	O	O
38	Production Class Code	CE	0429	[0..1]	[0..1]	O	O
39	Tribal Citizenship	CWE	0171	[0..1]	[0..1]	O	O

PID Field Usage Notes

PID-1 Set ID - PID (SI)

This field contains the number that identifies this transaction. For a VXU, this should always be 1.

While the CDC IG lists an optionality of RE for this field, the CIR HL7 Web Service ignores this field. The CIR HL7 Web Service processes the first PID segment within a VXU and ignores any subsequent PID segments.

PID-3 Patient Identifier List (CX)

This field contains the list of identifiers (one or more) used by the healthcare facility to uniquely identify a patient.

> PID-3 was required by the CDC IG for version 2.3.1 but considered optional by the CIR HL7 Web Service; however, for 2.5.1, it is required by the CDC IG and required by the CIR HL7 Web Service.

It is strongly recommended, but not required, that the CIR's HL7 Data Exchange Partners include the following patient identifiers in their VXU messages because it will significantly decrease the time that it takes for the CIR HL7 Web Service to process and respond to the messages as well as increase the likelihood that a patient match will be found:

- Local Registry ID (LR)
- Medical Record Number (MR)
- Medicaid Number (MA)
- Medicare Number (MC)

The CIR HL7 Web Service does not support the full data set of identifiers; for example, Social Security Number (SS) and Birth Registry Number (BR) are currently not supported. **Do not send Social Security Number**. See the Identifier Type Table 0203 in Appendix A of this document for values supported by the CIR database. Unsupported identifiers will be ignored.

> The Local Registry ID is used to communicate the CIR's unique identifier (CIR ID) for the patient. The CIR HL7 Web Service will transmit the CIR ID back to the HL7 data exchange partner in an acknowledgement message (ACK). When returning an ACK message in response to a VXU message, the CIR HL7 Web Service will return the CIR ID in the MSH-10 field using the following format: "message identifier:CIR ID". When returning an RSP message in response to a QBP message, the CIR HL7 Web Service will return the CIR ID and if available, the MR in the PID-3 (Patient Identifier List) field. The HL7 data exchange partner should store the Local Registry ID with their patient records and include that identifier in subsequent VXU and QBP messages.

As of May 2022, multiple identifiers of the same type (e.g., multiple Medicaid Numbers) will be accepted if sent. A single VXU message may contain multiple MRNs for the same patient. The Medical Record Number is no longer required and may be left empty. However, if provided, the Medical Record Number cannot exceed 36 characters. The Medicaid Number cannot exceed 8 characters and must also be in the correct format, e.g., AA12345A. The Medicare number must have at least 10 characters and cannot exceed 36 characters.

If the identifier exceeds the character limit or is formatted incorrectly, it will be reported as a non-fatal error and the identifier disregarded. If a patient identifier is included (PID-3.1) but the identifier type (PID-3.5) is missing, the number will be disregarded, and the missing type reported as a non-fatal error.

If sending a Medical Record Number (which is no longer required) CIR HL7 Data Exchange Partners may value assigning authority (PID-3.4) with a Facility Code assigned by the NYC DOHMH. Other values for assigning authority (e.g., grantee code) are not supported at this time and be considered invalid.

If a Medical Record Number is sent but PID-3.4 is empty or contains an invalid value, the CIR HL7 Web Service shall default assigning authority to the facility code associated with Sending Responsible Organization (MSH-22 or MSH-4.2). If Sending Responsible Organization is invalid or not populated, the CIR HL7 Web Service will then default assigning authority to the Administering Facility (RXA-11.4) for the last administered vaccine.

If sending the CIR ID with an identifier type of LR (PID-3.5), CIR HL7 Data Exchange Partners shall value PID-3.5 with “BAA”, the grantee code for New York City.

PID-5 Patient Name (XPN)

This field contains the names of the patient. **This is a required field.**

The CIR HL7 Web Service will accept the patient’s primary/legal (PID-5.1.7 name type of “L”) and alias/alternate (PID-5.2.7 name type of “A”) names.

The primary/legal name of the patient should be reported first, and the alias/alternate name reported second.

Example:
|Mason^Matthew^Thomas^^^^L~Masen^Matt^^^^^A|

The CIR HL7 Web Service will process the first legal (L) and alias (A) name in the list of repeating names. CIR will also accept a name type of “M” to report a patient’s maiden name (see PID-6 for reporting mother’s maiden name); all others will be ignored.

As of January 1, 2020, CIR HL7 Web Service no longer accepts VXUs for which the first name of the child is generic (e.g., “BOY”, “GIRL”, “BABY GIRL”).

If a VXU is reported with a generic first name and less than three immunization records, where each immunization was administered within 24 days of the patient’s DOB, the CIR HL7 Web Service will reject the message and return a fatal error. Rejected messages <= 8 weeks old are re-processed weekly to match with a vital record. See Appendix B for example.

If a name type is not provided in PID-5.1.7, a non-fatal error will be reported and the first name will be considered the legal name and the second name, if provided, will be consider the alias/alternate name.

The patient’s primary Last/Family Name (PID-5.1.1) and Patient First/Given Name (PID-5.1.2) are required; if omitted a fatal error will be reported. The Patient Middle Name (PID-5.1.3) should be included, if available.

Other PID-5 components, (e.g., Last Name Prefix, Suffix, Prefix, and Degree), are not required and, if provided, will be ignored.

The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise, it will be truncated and reported as a non-fatal error and name cannot begin with a number.

> In 2.3.1 messages, Patient Alias is reported in PID-9. For 2.5.1 messages, PID-9 is no longer supported; Patient Alias should be reported in PID-5.

PID-6 Mother's Maiden Name (XPN)

This field contains the family name under which the mother was born (i.e., before marriage). It is used to distinguish between patients with the same last name.

The Last/Family Name (PID-6.1.1) and First/Given Name (PID-6.1.2) must each be 25 characters or less; otherwise, it will be truncated, and a non-fatal error reported.

The name type (PID-6.1.7) should be "M" for Maiden. If a name type is not provided in PID-6.7 or the name type is other than "M", the name in PID-6 will still be considered the maiden name of the patient's mother and no error will be reported.

Other PID-6 components, (e.g., Middle Name, Last Name Prefix, Suffix, Prefix, and Degree), if provided, will be ignored.

PID-7 Date/Time of Birth (TS_NZ)

This field contains the patient's date and time of birth. **This is a required field.**

The date must be in the YYYYMMDD format; otherwise, it will be considered a fatal error. The time component of the data will be ignored if it is provided.

Additional date validation rules for date of birth include:

- The Patient's DOB must be on or before the current date.
- The Patient's DOB must be greater than Mother's DOB (if Mother's DOB is provided).
- The Patient's DOB field must be at least 10 years after the Mother's DOB (if Mother's DOB is provided).
- The Immunization Date must be greater than or equal to the Patient's DOB.
- The Patient's DOB and the Immunization Date must each be less than 120 years in the past.

Violation of the above validation rules will also be considered a fatal error.

PID-8 Administrative Sex (IS)

This field contains the patient's sex.

The CIR HL7 Web Service accepts the values specified in User-defined Table 0001 for Administrative Sex. If PID-8 is not valued or contains an unsupported value, the CIR HL7 Web Service will report a non-fatal error.

The CIR HL7 Web Service no longer utilizes a name to gender (sex) mapping process to identify the sex if a VXU message is received with a PID-8 value of "U."

Supported values for Administrative Sex are listed here for convenience.

Preferred HL7 Code	Alternative HL7 Code	Description
F	F	Female
M	M	Male
U	U	Unknown
	CIR Codes	Description *CIR codes are used for values below
D	UND	Undetermined / Undifferentiated
N	NFNM	Neither Female nor Male
P	PNTA	Prefer Not to Answer
O	OTH	Other
A	NA	Not Asked

PID-10 Race (CE)

This field refers to the patient's race.

The CIR supports all the governmentally assigned numeric Race code values listed in Table 0005 in the CDC IG. Additionally, CIR supports two CIR assigned codes for "Two or More Races" and "Prefer Not to Answer." All other values will be ignored and the VXU message processed as if PID-10 was not valued. If PID-10 is not populated or contains an invalid value, the CIR HL7 Web Service will store value of "Not Indicated" for race and return a non-fatal error.

If reporting a patient of two or more races, report using value of "TOMR." If multiple values for race are sent, the CIR HL7 Web Service will process the first Race in the list of repeating Races; all others will be ignored.

Supported values for race are listed below for convenience.

US Race Codes	Description
1002-5	American Indian or Alaska Native
2028-9	Asian
2076-8	Native Hawaiian or Other Pacific Islander
2054-5	Black or African-American
2106-3	White
2131-1	Other Race
<empty field>	CIR will store as “Not Indicated” and return non-fatal error
PHC1175	Refused to Answer
ASKU	Asked but No Answer
CIR Race Codes	Description CIR codes are used for values below due to corresponding CDC Race and Ethnicity Codes being not yet available
UNK	Unknown / Undetermined
TOMR	Two or More Races
PNTA	Prefer Not to Answer

Asked but no answer (ASKU), Prefer not to answer (PNTA), and Refused to answer (PHC1175) all mean the same and can be used interchangeably. Not required to use all three.

If sending an HL7 code for Race, use “HL70005” or “CDCREC” for the corresponding code system. If sending a CIR code for race, use “CIR” for the corresponding code system.

Example:

|**TOMR^Two or More Races^CIR|**

|**PNTA^Prefer Not to Answer^CIR|**

|**UNK^Unknown or Undetermined^CIR|**

The CIR HL7 Web Service does not support NIP alpha race codes.

If both alpha and numeric codes are sent, per the CDC IG, the second triplet of the CE data type for race should be used for the above governmentally assigned numeric codes (####-#) as the first triplet is reserved for use (backward compatibility) of NIP alpha race codes.

Example:
|W^White^NIP^**2106-3^White^HL70005**| - or - |**2106-3^White^HL70005**|

PID-11 Patient Address (XAD)

This field contains the mailing address of the patient.

Example:
|305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345-1234^^P|

The CIR HL7 Web Service will process the address in the first position (which, per the CDC IG, is reserved for the patient's primary/permanent address); additional addresses, if sent, will be ignored. If Address Type (PID-11.7) is missing or other than "P" (Permanent) it will be treated as if "P" was sent and no error reported.

If any PID-11 component is valued then all the following components should be valued: Street Address (PID-11.1.1), City (PID-11.3), State (PID-11.4), and Zip (PID-11.5); otherwise, a non-fatal error will be reported for each omitted component.

PID-11 should be valued as follows:

- Street or Mailing Address (PID-11.1.1) should contain the house (dwelling) number in the beginning of the field followed by the street name. If the value exceeds 40 characters, it will be truncated.
    - If PID-11.1.1 is valued, then PID-11.1.2 (Street Name) and PID-11.1.3 (Dwelling Number) should also be valued. PID-11.1.2 and PID-11.1.3 are optional; however, valuing these components will aid in data quality and patient searches.
- Other Designation (PID-11.2) should contain the apartment or suite number, if applicable. The apartment number cannot exceed 10 characters, otherwise it will be truncated.
- City (PID-11.3) cannot exceed 40 characters, otherwise it will be truncated.
- The State (PID-11.4) cannot exceed 2 characters; otherwise, the state will be set to "NY".
- The ZIP (PID-11.5) cannot be less than 5 digits, otherwise it will be disregarded.
- ZIP Code (PID-11.5) cannot exceed 10 characters; otherwise, the first 5 characters of the zip will be accepted and the ZIP+4 will be disregarded.
    - The CIR HL7 Web Service supports the standard ZIP code formats of either ##### (5-digit ZIP only) or #####-#### (ZIP+4 including hyphen). If ZIP+4 is sent, the hyphen may be included but is not required.

Errors, (e.g., character maximum exceeded, invalid state code, ZIP less than 5 digits, missing component, etc.) will be reported as non-fatal.

PID-13 Phone Number - Home (XTN)

This field contains the patient's primary residence (i.e., home, non-cellular) phone number, personal cell phone number, and/or personal email address. This information should be sent, if known. If missing, a non-fatal warning will be returned.

The CIR database and the CIR HL7 Web Service support a single current home phone, personal cellular phone number, and personal email address per patient.

- When sending the patient's home (non-cellular) phone, the following components of PID-13 should be completed:
    - PID-13.2: Telecommunication Use Code of "PRN" for Primary Residence (Home) Number
    - PID-13.3: Telecommunication Equipment Code of "PH" for Phone

- PID-13.6: Area code
- PID-13.7: Phone number

- When sending the patient's cell phone number, the following components of PID-13 should be completed:
  - PID-13.2: Telecommunication Use Code of "PRN" for Primary Residence (Home) Number, "EMR" for Emergency Number, or "ORN" for Other Residence Number.
  - PID-13.3: Telecommunication Equipment Code of "CP" for Cellular Phone
  - PID-13.6: Area code
  - PID-13.7: Phone number
- When sending the patient's email address, the following components of PID-13 should be completed:
  - PID-13.2: Telecommunication Use Code of "NET" for Network (Email) Address
  - PID-13.3: Telecommunication Equipment Code of "X.400" or "Internet" for Email Address
  - PID-13.4: Email address

For PID-13, the CIR HL7 Web Service only supports the Telecommunication Use Codes (from HL7-defined Table 0201) and Telecommunication Equipment Type Codes (from HL7-defined Table 0202) listed above. See Appendix A of this IG for a full list of the Telecommunication Use Codes and Telecommunication Equipment Type Codes supported by the CIR HL7 Web Service. Codes are provided below for convenience.

HL7-defined Table 0201 – Telecommunication Use Code

Value	Description	Constraints When Used in a VXU
PRN	Primary Residence Number	Used in PID-13 and NK1-5
ORN	Other Residence Number	Used in PID-13 and NK1-5
EMR	Emergency Number	Used in PID-13 and NK1-5
NET	Network (Email) Address	Used in PID-13 and NK1-5
WPN	Work number	Used in NK1-6

HL7-defined Table 0202 – Telecommunication Equipment Type Codes

Value	Description	Constraints When Used in a VXU
PH	Phone	Used in PID-13 and NK1-5 with Telecommunication Use of "PRN" for Primary Residence. Used in NK1-6 with Telecommunication Use of "WPN" for Work.
CP	Cell Phone	Used in PID-13 and NK1-5 with Telecommunication Use of "PRN" for Primary Residence, "ORN" for Other Residence, and "EMR" for Emergency.
X.400	Email Address	Used in PID-13 and NK1-5 with Telecommunication Use of "NET" for Network (Email) Address.
Internet	Internet Address	Also allowed in PID-13 and NK1-5 with Telecommunication Use of "NET" for Network (Email) Address.

Each telecommunication type shall have its own repetition.

Example:
|**^PRN^PH^^^212^5551212~^ORN^CP^^^927^5551212~^NET^X.400^jon.doe2@isp.com**|

- The first occurrence contains the home number (Telecommunication Use Code of "PRN") and is a (non-cellular) phone (Telecommunication Equipment Type of "PH"). The phone number is (212) 555-1212. This phone number will be stored as the patient's home phone number.
- The second occurrence contains the other residence/home number (Telecommunication Use Code of "ORN") and is a cellular phone (Telecommunication Equipment Type of "CP"). The phone number is (937) 555-1212. This number will be stored as the patient's cellular phone number.
- The third occurrence contains the email address (Telecommunication Use Code of "NET" and Telecommunication Equipment Type of "X.400"). The email address is jon.doe2@isp.com and will be stored as the patient's email address.

The first occurrence should be used for the primary number (for backward compatibility). If the primary number is not sent, then a repeat delimiter should be sent in the first occurrence.

Example:
|**~^EMR^CP^^^927^5551212~^NET^X.400^jon.doe2@isp.com**|

HL7 Data Exchange Partners should comply with the order specified above by the CDC IG (i.e., primary number sent in the first occurrence only and the first occurrence left blank if the primary number is not sent); however, the CIR HL7 Web Service will not disregard data or report errors if this guidance is not followed.

Additional rules are as follows:

- If multiple repetitions are sent for the same equipment type (e.g., multiple cell phone numbers, multiple email addresses, or multiple phone numbers), the CIR HL7 Web Service will process the first occurrence only; each subsequent occurrence will be ignored, and no error returned.
  - In the following example, two cell phone numbers are provided. The CIR HL7 Web Service will process the first occurrence (and store the patient's cell phone number as (212) 222-1111) and will ignore the second cell phone number.

    |**^PRN^CP^^^212^2221111~^EMR^CP^^^404^4441414**|

- When sending a home phone and/or a cell phone:
  - If PID-13.6 (area code) is not valued or contains errors (e.g., is not 3 digits), a non-fatal error will be reported, and the area code will be disregarded.
  - If PID-13.7 (phone number) is not valued or contains errors (e.g., is not 7 digits), a non-fatal error will be reported and the phone number (and area code, if valued) will be disregarded.
- While the XTN data type always requires the 2nd component (Use Code) and considers the 3rd component (Equipment Type) to be RE (required but may be empty if not known), the NYC CIR HL7 Web Service usage rules for Use Code and Equipment Type differ depending on the data submitted, as shown in the following business rules. In some cases, we relax the usage while in other cases we tighten the usage.
  - If PID-13.2 (Use) is "PRN" and PID-13.3 (Equipment Type) is not valued (i.e., unknown if the phone number is a cell or non-cell phone), it will be treated as if "PH" was sent, no error will

be reported, and the phone number (if properly formatted) will be stored as the patient's home phone (as opposed to their cell phone).

- If PID-13.3 (Equipment Type) is "PH" and PID-13.2 (Use) is not valued or other than "PRN" or "NET" (which should only be used when sending an email address), it will be treated as if "PRN" was sent, no error will be reported, and the phone number (if properly formatted) will be stored as the patient's home phone.
- If PID-13.2 (Use) is "ORN" or "EMR" and PID-13.3 (Equipment Type) is not valued (i.e., unknown if the phone number is a cell or non-cell phone), the phone number will be disregarded and a non-fatal MissingValue error will be reported.
- If PID-13.3 (Equipment Type) is "CP" and PID-13.2 (Use) is not valued or other than "PRN", "ORN", or "EMR" then the cell number will be disregarded and a non-fatal MissingValue or TableValueNotFound error (as appropriate) will be reported.
- If PID-13.2 (Use) is "NET" then PID-13.4 (Email Address) is required; if PID-13.4 is not valued or contains errors (e.g., invalid email address format), the email will be disregarded and a non- MissingValue or BadFormat error (as appropriate) will be reported.
- If PID-13.2 (Use) is "NET" and PID-13.3 (Equipment Type) is other than "X.400" or "Internet" then the email address, if formatted correctly, will be accepted; however, a non-fatal MissingValue or TableValueNotFound error will be reported.
- If PID-13.4 (Email Address) is valued but PID-13.2 (Use) is not valued or other than "NET" then the email address will be disregarded and a non-fatal MissingValue or TableValueNotFound error (as appropriate) will be reported.
- If PID-13.7 (Phone Number) is valued but both PID-13.2 (Use) and PID-13.3 (Equipment Type) are not valued then it will be treated as if "PRN" and "PH" were sent, no error will be reported, and the phone number (if properly formatted) will be stored as the patient's home phone; if PID-13.4 (Email) is also valued in the same repetition, the email will be ignored.

PID-15 Primary Language (CE)

This field contains the patient's primary language.

It is important to note **that HL7 has changed the code set for language** to harmonize with the international standard ISO 639. ISO-369 is comprised of five different parts: Part 1: ISO 639-1:2002 provides a 2-letter code that has been designed to represent most of the major languages of the world. **Part 1**: ISO 639-1:2002 provides a 2-letter code that has been designed to represent most of the major languages of the world.
Part 2: ISO 639-2:1998 provides a 3-letter code, which gives more possible combinations, so ISO 639-2:1998 can cover more languages. **Part 3:** ISO 639-3:2007 provides a 3-letter code and aims to give as complete a listing of languages as possible, including living, extinct and ancient languages. **Part 4:** ISO 639-4:2010 gives the general principles of language coding and lays down guidelines for the use of ISO 639 and **Part 5:** ISO 639-5:2008 provides a 3-letter code for language families and groups (living and extinct). The CDC IG indicates that the ISO 639 shall be used for Language (as defined in Table 0296 – Primary Language.

The CIR HL7 Web Service accepts all ISO 639 language codes. Failure to use the new ISO 639 language codes will result in a TableValueNotFound non-fatal error.

PID-22 Ethnic Group (CE)

This field further defines the patient's ancestry.

The CIR HL7 Web Service supports the following ethnicity codes:

- N^Not Hispanic or Latino^HL70189
- H^ Hispanic or Latino^HL70189
- U^ Unknown^HL70189
- 2186-5^Not Hispanic or Latino^CDCREC
- 2135-2^ Hispanic or Latino^CDCREC
- PNTA^Prefer Not to Answer^CIR

Other values will be disregarded, and a non-fatal error reported. The CIR HL7 Web Service will process the first Ethnicity code (i.e., PID-22.1) and will ignore any additional/alternate ethnicity code (PID-22.4).

If PID-22 is left blank or contains an invalid value, the CIR HL7 Web Service will default to "Unknown" and return a non-fatal error.

PID-23 Birth Place (ST)

The Birth Place will be validated against a list of Birth Facilities in the CIR database. If the submitted Birth Place cannot be validated, it will be defaulted to "Unknown" and a non-fatal error reported. Birth place is an optional field and may be left blank.

PID-24 Multiple Birth Indicator (ID)

This field indicates whether the patient was part of a multiple birth.

The acceptable values are Y (if the patient was part of a multiple birth) and N (if the patient was a single birth); all other values will be disregarded and reported as a non-fatal error. If the status is undetermined, then the field should be empty.

PID-25 Birth Order (NM)

For patients that were part of a multiple birth, this field indicates the birth order. If Multiple Birth Indicator (PID-24) is populated with Y, then this field should contain the number indicating the person's birth order, with 1 for the first child born and 2 for the second.

The CIR HL7 Web Service captures the number provided in PID-25 as the patient's birth order irrespective of the value provided in PID-24 (Multiple Birth Indicator). PID-25 will be ignored if it is not valued, or its value is not a number.

PID-29 Patient Death Date and Time (TS)

This field, which contains the date and time at which the patient death occurred.

> The HL7 Data Exchange Partner should send the Patient Death Indicator (PID-30) and the Patient Death Date and Time (PID-29), if known.
>
> The CIR HL7 Web Service currently processes Patient Death Indicator (PID-30) and, when the value is "Y", stores a MOGE code of "D" for Deceased. The date of the message is captured as the date death was reported.

PID-30 Patient Death Indicator (ID)

This field indicates whether the patient is deceased.

The acceptable values for PID-30 are Y (if the patient is deceased) and N (if the patient is not deceased). If the status is undetermined, then PID-30 should not be valued.

PID-30 will be ignored if it is not valued, or its value is other than “Y”.

PD1—Patient Demographic Segment

The Patient Demographic segment contains patient demographic information that may change from time to time.

There are three primary uses for the Patient Demographic (PD1) segment in Immunization Messages. These include indicating whether the person wants his/her data protected (PD1-12 and PD1-13), whether the person wants to receive recall/reminder notices (PD1-11), and the person’s status in the registry (PD1-16 and PD1-17). The CIR currently supports the protection indicator (PD1-12) and protection indicator effective date (PD1-13) fields.

Table 3-3 Patient Demographic Segment (PD1) in a VXU

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Living Dependency	IS				O	O
2	Living Arrangement	IS				O	O
3	Patient Primary Facility	XON				O	O
4	Patient Primary Care Provider Name & ID No.	XCN				X	X
5	Student Indicator	IS				O	O
6	Handicap	IS				O	O
7	Living Will Code	IS				O	O
8	Organ Donor Code	IS				O	O
9	Separate Bill	ID				O	)
10	Duplicate Patient	CX				O	O
11	Publicity Code	CE	0215	[0..1]		RE	X
12	Protection Indicator	ID	0136	[0..1]	[0..1]	RE	R
13	Protection Indicator Effective Date	DT_D		[0..1]	[0..1]	C(RE/X)	C(RE/X)
14	Place of Worship	XON				O	O
15	Advance Directive Code	CE				O	O
16	Immunization Registry Status	IS	0441	[0..1]	[0..0]	RE	X
17	Immunization Registry Status Effective Date	DT_T		[0..1]	[0..1]	C(RE/X)	X
18	Publicity Code Effective Date	DT_T		[0..1]	[0..1]	C(RE/X)	X
19	Military Branch	IS				O	O
20	Military Rank/Grade	IS				O	O
21	Military Status	IS				O	O

PD1 Field Usage Notes

PD1-12 Protection Indicator (ID)

This field identifies whether a person's information may be shared with others. This field conveys the current state (opt in or opt out) in the sending system. The protection state must be actively determined by the clinician.

Protection State	Code	CIR Actions
Yes, protect the data. Client has indicated that the information shall be protected. (Do not share data.)	Y	Reads HL7 message, if provided; Does not store data; Does not share with others.
No, it is not necessary to protect data from other clinicians. Client has indicated that the information does not need to be protected. (Data may be shared.)	N	Reads HL7 message; Stores data; Shares with others.
Clinician does not collect required patient's wishes regarding information sharing	PD1-12 is empty or Unknown (UNK)	Reads HL7 message; Rejects HL7 message; Does not store data; Does not share with others.

- CIR will only validate PD1-12 for patients 19 years of age and older pursuant to the New York State immunization reporting requirement for those 18 years and under. For patients 19 years of age and older, the PD1-12 field will be validated by the CIR HL7 Web Service at each VXU message submission, except for vaccines with public health emergency order.
    - Data exchange partners should document the patient's consent related to sharing their information for patients 19 years of age and older.
    - For patients 19 years of age and older, PD1-12 should always be valued.
- If PD1-12 is valued with "N" (do not protect) for a new patient record, the patient may be added to the CIR, and the protection indicator value and protection indicator effective date in PD1-13 (if sent) will be stored.
- If an unsupported value is sent in PD1-12, the message will be rejected.
- Adult patient records reported with protection indicator = "Y" (protect) will not be added, and their record will be marked as protected (if their record previously existed in the CIR) for current vaccination reported and all future reporting. The CIR will return, 'PatientNotAddedDueToProtectionIndicatorValue' error message when a patient match was not found.
- Once an accepted value (Y or N) has been reported for a patient and stored in the CIR, it is assumed the existing protection status remains effective until a different protection status is reported.
- If protection indicator is not documented and HL7 message is blank, the CIR will return a fatal error and will not add the vaccination record. If the record was for a new patient, the patient will not be added.

***Notes on Protection Indicator values for HL7 v2.3.1**

- For data exchange partners sending VXU messages using HL7 v2.3.1, the protection indicator values indicate the reverse intention from the HL7 v2.5.1 values.

PD1-13 – Protection Indicator Effective Date (DT_D)

This field indicates the effective date for PD1-12 - Protection Indicator.

This field is conditionally required by the CIR HL7 Web Service.

Conditional predicate: If PD1-12 is valued.

The PD1-13 field will not be validated if PD1-12 is not valued with “Y” or “N”.

- If PD1-12 is valued, then the effective date submitted in PD1-13 should be within fourteen days of the date the message was submitted to the CIR.

  Example:
  PD1| | | | | | | | | | | |N|20130409|

NK1—Next of Kin Segment

This segment should be used to communicate the name and contact information for the patient’s mother, father, and/or guardian, if known. Multiple NK1 segments can be sent for a patient, for example, to provide the mother’s, the father’s, and the guardian’s names and contact information.

Table 4-4 Next of Kin Segment (NK1) in a VXU

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Set ID - NK1	SI		[1..1]	[1..1]	R	R
2	Name	XPN		[1..*]	[1..1]	R	R
3	Relationship	CE	0063	[1..1]	[1..1]	R	R
4	Address	XAD		[0..*]	[0..1]	RE	RE
5	Phone Number	XTN		[0..*]	[0..*]	RE	RE
6	Business Phone Number	XTN		[0..*]	[0..1]	O	RE
7	Contact Role	CE	0131	[0..1]	[0..1]	O	O
8	Start Date	DT		[0..1]	[0..1]	O	O
9	End Date	DT		[0..1]	[0..1]	O	O
10	Next of Kin / Associated Parties Job Title	ST		[0..1]	[0..1]	O	O
11	Next of Kin / Associated Parties Job Code/Class	JCC	0327	[0..1]	[0..1]	O	O
12	Next of Kin / Associated Parties Employee Number	CX		[0..1]	[0..1]	O	O
13	Organization Name - NK1	XON		[0..1]	[0..1]	O	O
14	Marital Status	CE	0002	[0..1]	[0..1]	O	O
15	Administrative Sex	IS	0001	[0..1]	[0..1]	O	O
16	Date/Time of Birth	TS		[0..1]	[0..1]	O	RE
17	Living Dependency	IS	0223	[0..1]	[0..1]	O	O
18	Ambulatory Status	IS	0009	[0..1]	[0..1]	O	O
19	Citizenship	CE	0171	[0..1]	[0..1]	O	O
20	Primary Language	CE	0296	[0..1]	-	O	O
21	Living Arrangement	IS	0220	[0..1]	[0..1]	O	O
22	Publicity Code	CE	0215	[0..1]	[0..1]	O	O
23	Protection Indicator	ID	0136	[0..1]	[0..1]	O	O
24	Student Indicator	IS	0231	[0..1]	[0..1]	O	O
25	Religion	CE	0006	[0..1]	[0..1]	O	O
26	Mother’s Maiden Name	XPN		[0..1]	[0..1]	O	O
27	Nationality	CE	0212	[0..1]	[0..1]	O	O
28	Ethnic Group	CE	0189	[0..1]	[0..1]	O	O
29	Contact Reason	CE	0222	[0..1]	[0..1]	O	O
30	Contact Person’s Name	XPN		[0..1]	[0..1]	O	O
31	Contact Person’s Telephone Number	XTN		[0..1]	[0..1]	O	O
32	Contact Person’s Address	XAD		[0..1]	[0..1]	O	O
33	Next of Kin/Associated Party’s Identifiers	CX		[0..1]	[0..1]	O	O
34	Job Status	IS	0311	[0..1]	[0..1]	O	O
35	Race	CE	0005	[0..1]	[0..1]	O	O
36	Handicap	IS	0295	[0..1]	[0..1]	O	O
37	Contact Person Social Security Number	ST		[0..1]	[0..1]	O	O
38	Next of Kin Birth Place	ST		[0..1]	[0..1]	O	O
39	VIP Indicator	IS	0099	[0..1]	[0..1]	O	O

NK1 Field Usage Notes

NK1-1 Set ID - NK1 (SI)

This field contains the number that identifies this transaction.

Multiple NK1 segments can be sent for a patient, for example, to provide the mother's, the father's, and the guardian's names and contact information. Each subsequent NK1 increments the previous set ID by 1. If three NK1 segments were sent in one message, the first would have a set id of 1, the second would have a set id of 2, and the third would have a set id of 3.

NK1-1 is required by the CDC IG; however, the CIR HL7 Web Service ignores this field.

When the CIR HL7 Web Service reports an error for an NK1 segment, the actual position of the NK1 within the VXU is used to report the error location/segment sequence (ERR-5.2) within the ACK response.

NK1-2 Name (XPN)

This field contains the name of the next of kin or associated party. **This is a required field.**

The CIR HL7 Web Service will process the first name in the list of repeating names; all others will be ignored.

Per the CDC IG, the first name in the list of repeating names should be the Legal name. The CIR HL7 Web Service does not validate that an HL7 Name Type of "L" for "Legal Name" is associated with the first name; the CIR HL7 Web Service considers the first name sent to be the Legal name and ignores the Name Type code in NK1-2.7.

A Last/Family Name (NK1-2.1.1) or First/Given Name (NK1-2.2) is required to add or update a next of kin / legal contact person record in the CIR database. If the Last Name and the First Name are both not valued, a non-fatal error will be reported and the entire NK1 segment will be disregarded.

The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise, it will be truncated and reported as a non-fatal error.

Other NK1-2 components, (e.g., Last Name Prefix, Suffix, Prefix, and Degree), are not required and, if provided, will be ignored.

The Last Name and First Name - along with Middle Name (NK1-2.3), contact information (NK1-4, NK1-5, and NK1-6), and date of birth (NK1-16) - should be provided, if known.

However, if the only data known is the mother's date of birth, that data can still be reported to the CIR. If the relationship type in NK1-3 is MTH (Mother), NK1-2 (Name) is not valued, but a date of birth is provided in NK1-16, then the CIR HL7 Web Service will record the mother's date of birth as an attribute of the patient; any additional data provided in the NK1 segment, e.g., contact data, will be disregarded and no errors will be reported.

NK1-3 Relationship (CE)

This field contains the personal relationship that the next of kin/associated party has to the patient. **This is a required field.**

The CIR HL7 Web Service will support the relationship types (from User-defined Table 0063; no other HL7 relationship types will be accepted. If a relationship type other than the accepted types is provided, or if the relationship type is not valued, a non-fatal error will be reported, and the NK1-3 field will be valued as "OTH (Other)." Value of "SEL – SELF" will be ignored by the CIR HL7 Web Service.

If multiple NK1 segments are sent with the same relationship type, but different patient names (NK1-2), all NK1 segments with a unique name will be stored. If multiple NK1 segments are sent with the same relationship type and same patient name (NK1-2), the last NK1 segment will be accepted and precedent NK1 segments for the same relationship type will be ignored.

NK1-4 Address (XAD)

While this field has a usage of “RE” per the CDC IG, the CIR does not capture the next of kin’s address. Therefore, the CIR HL7 Web Service will ignore this field if valued.

NK1-5 Phone Number (XTN)

This field contains the primary residence (i.e., home, non-cellular) phone number, personal cell phone number, and/or personal email address of the next of kin (i.e., the relationship type specified in NK1-3). This information should be sent, if known.

The CIR database and the CIR HL7 Web Service support a single current home phone, personal cellular phone number, and personal email address per mother, father, and guardian.

- When sending the home (non-cellular) phone, the following components of NK1-5 should be completed:
    - NK1-5.2: Telecommunication Use Code of “PRN” for Primary Residence (Home) Number
    - NK1-5.3: Telecommunication Equipment Code of “PH” for Phone
    - NK1-5.6: Area code
    - NK1-5.7: Phone number
- When sending the cell phone number, the following components of NK1-5 should be completed:
    - NK1-5.2: Telecommunication Use Code of “PRN” for Primary Residence (Home) Number, “EMR” for Emergency Number, or “ORN” for Other Residence Number.
    - NK1-5.3: Telecommunication Equipment Code of “CP” for Cellular Phone
    - NK1-5.6: Area code
    - NK1-5.7: Phone number
- When sending the email address, the following components of PID-13 should be completed:
    - NK1-5.2: Telecommunication Use Code of “NET” for Network (Email) Address
    - NK1-5.3: Telecommunication Equipment Code of “X.400” or “Internet” for Email Address
    - NK1-5.4: Email address

For NK1-5, the CIR HL7 Web Service only supports the Telecommunication Use Codes (from HL7-defined Table 0201) and Telecommunication Equipment Type Codes (from HL7-defined Table 0202) listed above. See Appendix A of this IG for a full list of the Telecommunication Use Codes and Telecommunication Equipment Type Codes supported by the CIR HL7 Web Service.

Each telecommunication type shall have its own repetition.

Example:
|**^PRN^PH^^^212^5551212~^ORN^CP^^^927^5551212~^NET^X.400^jon.doe2@isp.com**|

- The first occurrence contains the home number (Telecommunication Use Code of "PRN") and is a (non-cellular) phone (Telecommunication Equipment Type of "PH"). The phone number is (212) 555-1212. This phone number will be stored as the mother/father/guardian's home phone number.
- The second occurrence contains the other residence/home number (Telecommunication Use Code of "ORN") and is a cellular phone (Telecommunication Equipment Type of "CP"). The phone number is (937) 555-1212. This number will be stored as the mother/father/guardian's cellular phone.
- The third occurrence contains the email address (Telecommunication Use Code of "NET" and Telecommunication Equipment Type of "X.400"). The email address is jon.doe2@isp.com and will be stored as the mother/father/guardian's email address.

The first occurrence should be used for the primary number (for backward compatibility). If the primary number is not sent, then a repeat delimiter should be sent in the first occurrence.

Example:
|**~^EMR^CP^^^927^5551212~^NET^X.400^jon.doe2@isp.com**|

HL7 Data Exchange Partners should comply with the order specified above by the CDC IG (i.e., primary number sent in the first occurrence only and the first occurrence left blank if the primary number is not sent); however, the CIR HL7 Web Service will not disregard data or report errors if this guidance is not followed.

Additional rules are as follows:

- If multiple repetitions are sent for the same telecommunications type (e.g., multiple cell phone numbers, multiple email addresses, or multiple phone numbers), the CIR HL7 Web Service will process the first occurrence only; each subsequent occurrence will be ignored, and no error returned.
  - In the following example, two cell phone numbers are provided. The CIR HL7 Web Service will process the first occurrence (and store the patient's cell phone number as (212) 222-1111) and will ignore the second cell phone number.

    |**^PRN^CP^^^212^2221111~^EMR^CP^^^404^4441414**|

- When sending a home phone and/or a cell phone:
  - If NK1-5.6 (area code) is not valued or contains errors (e.g., is not 3 digits), a non-fatal error will be reported, and the area code will be disregarded.
  - If NK1-5.7 (phone number) is not valued or contains errors (e.g., is not 7 digits), a non-fatal error will be reported and the phone number (and area code, if valued) will be disregarded.
- While the XTN data type always requires the 2nd component (Use Code) and considers the 3rd component (Equipment Type) to be RE (required but may be empty if not known), the NYC CIR HL7 Web Service usage rules for Use Code and Equipment Type differ depending on the data submitted, as shown in the following business rules. In some cases, we relax the usage while in other cases we tighten the usage.

- If NK1-5.2 (Use) is “PRN” and NK1-5.3 (Equipment Type) is not valued (i.e., unknown if the phone number is a cell or non-cell phone), it will be treated as if “PH” was sent, no error will be reported, and the phone number (if properly formatted) will be stored as the patient’s home phone (as opposed to their cell phone).
- If NK1-5.2 (Use) is “ORN” or “EMR” and NK1-5.3 (Equipment Type) is not valued (i.e., unknown if the phone number is a cell or non-cell phone), the phone number will be disregarded and a non-fatal MissingValue error will be reported.
- If NK1-5.3 (Equipment Type) is “PH” and NK1-5.2 (Use) is not valued or other than “PRN” or “NET” (which should only be used when sending an email address), it will be treated as if “PRN” was sent, no error will be reported, and the phone number (if properly formatted) will be stored as the home phone.
- If NK1-5.3 (Equipment Type) is “CP” and NK1-5.2 (Use) is not valued or other than “PRN”, “ORN”, or “EMR” then the cell number will be disregarded and a non-fatal MissingValue or TableValueNotFound error (as appropriate) will be reported.
- If NK1-5.2 (Use) is “NET” then NK1-5.4 (Email Address) is required; if NK1-5.4 is not valued or contains errors (e.g., invalid email address format), the email will be disregarded and a non- MissingValue or BadFormat error (as appropriate) will be reported.
- If NK1-5.2 (Use) is “NET” and NK1-5.3 (Equipment Type) is other than “X.400” or “Internet” then the email address, if formatted correctly, will be accepted; however, a non-fatal MissingValue or TableValueNotFound error will be reported.
- If NK1-5.4 (Email Address) is valued but NK1-5.2 (Use) is not valued or other than “NET” then the email address will be disregarded and a non-fatal MissingValue or TableValueNotFound error (as appropriate) will be reported.
- If NK1-5.7 (Phone Number) is valued but both NK1-5.2 (Use) and NK1-5.3 (Equipment Type) are not valued then it will be treated as if “PRN” and “PH” were sent, no error will be reported, and the phone number (if properly formatted) will be stored as the next of kin’s home phone; if NK1-5.4 (Email) is also valued in the same repetition, the email will be ignored.

NK1-6 Business Phone Number (XTN)

This field contains the business telephone number of the next of kin/associated party and should be sent, if known. If sent, the primary business telephone number must be sent in the first sequence.

Example:
|**^WPN^^^^212^5551414^100**|

The CIR HL7 Web Service will process the phone number in the first position (which, per the CDC IG, is reserved for the primary work phone number). All other phone numbers and any email address, if sent, will be ignored.

The CIR HL7 Web Service will process the 6th, 7th, and 8th components (area code, local phone number, and extension) of the first phone number; all other components will be ignored.

When providing a phone number, the NK1-6.6 component (area code) and NK1-6.7 component (local phone number) should be valued; otherwise, a non-fatal error will be reported for the omitted component.

If NK1-6.6 and NK1-6.7 of the first phone number contains errors, (e.g., area code is not 3 digits, phone number is not 7 digits), those errors will be reported as non-fatal errors.

Since the CIR HL7 Web Service does not allow this field to repeat and the first repetition must be the primary work number, if the Telecommunication Use Code Type (NK1-6.2) is missing or other than "WPN" (Work Number) it will be treated as if "WPN" was sent and no error reported.

NK1-16 Date/Time of Birth (TS)

This is the date of birth of the next of kin/associated party and should be sent, if known.

Of the Relationship Types supported by the CIR HL7 Web Service, only the Mother's date of birth will be captured if sent; date of birth for Father or Guardian, if sent, will be ignored.

The Mother's date of birth must be in the YYYYMMDD format and a valid date according to the CIR's date/time validation rules; otherwise, it will be disregarded, and a non-fatal error reported. The time component of the data will be ignored if it is provided.

Additional validation rules that apply to the Mother's date of birth include:

- The Patient's DOB must be greater than the Mother's DOB.
- The Patient's DOB must be at least 10 years after the Mother's DOB.

Violation of the above Patient's DOB/Mother's DOB validation rules will be considered a fatal error.

PV1—Patient Visit Segment

If present, the entire PV1 segment is ignored by the CIR HL7 Web Service.

> In previous releases, for example 2.3.1, the primary use of the PV1 segment in immunization messages was to carry information about the client's VFC eligibility status. This is now recorded at the immunization event (dose administered) level via an OBX segment.

PV2 —Patient Visit Segment

If present, the entire PV2 segment is ignored by the CIR HL7 Web Service.

GT1—Guarantor Segment

If present, the entire GT1 segment is ignored by the CIR HL7 Web Service.

IN1—Insurance Segment

If present, the entire IN1 segment is ignored by the CIR HL7 Web Service.

IN2—Insurance Segments

If present, the entire IN2 segment is ignored by the CIR HL7 Web Service.

IN3—Insurance Segments

If present, the entire IN3 segment is ignored by the CIR HL7 Web Service.

ORC—Order Request Segment

The Common Order segment (ORC) is used to transmit fields that are common to all orders (all types of services that are requested). **When sending a VXU message, each RXA must be associated with one ORC, based on HL7 2.5.1 standard.**

Each RXA must be associated with one ORC, based on HL7 2.5.1 standard; this is a change from the 2.3.1 standard. In the 2.3.1 standard the ORC is optional and, in fact, rarely included in a VXU.

Table 4-5 Order Request Segment (ORC) in a VXU

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Order Control	ID	0119	[1..1]	[1..1]	R	R
2	Placer Order Number	EI		[0..1]	[0..1]	RE	RE
3	Filler Order Number	EI		[1..1]	[1..1]	R	RE
4	Placer Group Number	EI		[0..1]	[0..1]	O	O
5	Order Status	ID	0038	[0..1]	[0..1]	O	O
6	Response Flag	ID	0121	[0..1]	[0..1]	O	O
7	Quantity/Timing	TQ		[0..0]	[0..0]	X	X
8	Parent	EIP		[0..1]	[0..1]	O	O
9	Date/Time of Transaction	TS		[0..1]	[0..1]	O	O
10	Entered By	XCN		[0..1]	[0..1]	RE	RE
11	Verified By	XCN		[0..1]	[0..1]	O	O
12	Ordering Provider	XCN		[0..1]	[0..1]	RE	C(RE/O)
13	Enterer's Location	PL		[0..1]	[0..1]	O	O
14	Call Back Phone Number	XTN		[0..1]	[0..1]	O	O
15	Order Effective Date/Time	TS		[0..1]	[0..1]	O	O
16	Order Control Code Reason	CE		[0..1]	[0..1]	O	O
17	Entering Organization	CE		[0..1]	[0..1]	O	O
18	Entering Device	CE		[0..1]	[0..1]	O	O
19	Action By	XCN		[0..1]	[0..1]	O	O
20	Advanced Beneficiary Notice Code	CE	0339	[0..1]	[0..1]	O	O
21	Ordering Facility Name	XON		[0..1]	[0..1]	O	O
22	Ordering Facility Address	XAD		[0..1]	[0..1]	O	O
23	Ordering Facility Phone Number	XTN		[0..1]	[0..1]	O	O
24	Ordering Provider Address	XAD		[0..1]	[0..1]	O	O
25	Order Status Modifier	CWE		[0..1]	[0..1]	O	O
26	Advanced Beneficiary Notice Override Reason	CWE	0552	[0..1]	[0..1]	O	O
27	Filler's Expected Availability Date/Time	TS		[0..1]	[0..1]	O	O
28	Confidentiality Code	CWE	0177	[0..1]	[0..1]	O	O
29	Order Type	CWE	0482	[0..1]	[0..1]	O	O
30	Enterer Authorization Mode	CNE	0483	[0..1]	[0..1]	O	O
31	Parent Universal Service Identifier	CWE		[0..1]	[0..1]	O	O

ORC Field Usage Notes

ORC-1 Order Control (ID)

This field determines the function of the Order Request segment. **This is a required field and for VXU messages, the value must be "RE".**

ORC-2 Placer Order Number (EI)

The CIR HL7 Web Service ignores this field.

ORC-3 (Filler Order Number) rather than ORC-2 (Placer Order Number) should be used to send the unique immunization id.

> Placer Order Number (ORC-2) and Filler Order Number (ORC-3) are unique identifiers from the system where an order was placed and where the order was filled. They were originally designed for managing lab orders. In the immunization context, it is not common to have one system placing and one filling an immunization order.
>
> In the context that ORC will be used in Immunization messaging, the use case that these have supported is to allow a system that sent an immunization record to another system to identify an immunization that needs to be changed using the Filler Order Number it had sent. The CDC IG specifies that Placer Order Number is RE (required, but may be empty); however, the Filler Order Number SHALL be sent and is the unique immunization id of the sending system.

ORC-3 Filler Order Number (EI)

The filler order number is used to uniquely identify this order among all orders sent by a provider organization that filled the order. **This is a required field per the CDC IG.**

The HL7 Data Exchange Partner should value ORC-3 with the unique immunization id for this immunization record.

In the case where a historical immunization is being recorded (i.e., from an immunization card), the sending system SHALL assign an identifier as if it were an immunization administered by a provider associated with the provider organization owning the sending system and value ORC-3 with that identifier.

Currently the CIR HL7 Web Service ignores the value provided in ORC-3. In the future, the CIR will store this value, in addition to its own internal id, and utilize both ids to accurately identify the previously sent immunization record, facilitating update or deletion of that record.

> The CIR database does not currently store the sending system's unique immunization identifier. Also, the CIR HL7 Web Service does not currently support immunization updates (except via the process defined in the *Updating Previously Reported Immunizations* chapter of this IG). However, the HL7 Data Exchange Partner should value ORC-3 as enhancements are forthcoming that would allow for updating immunization data utilizing the sending system's unique ID to identify the immunization record to be updated.

ORC-10 Entered By (XCN)

The Entered By field identifies the individual that entered this particular order. Within a VXU, ORC-10 may be used in conjunction with an RXA to indicate who recorded a particular immunization.

While this field has a usage of RE (required, but may be empty) per the CDC IG, the CIR does not capture who entered the order, therefore, the CIR HL7 Web Service will ignore ORC-10 if valued.

ORC-12 Ordering Provider (XCN)

This field contains the identity of the person who is responsible for creating the request (i.e., the ordering physician). The CIR HL7 Web Service accepts either a provider license number or a national provider identifier (NPI) number.

When reporting immunizations or observations the Ordering Provider should be sent, if known, and valued as follows:

- ID Number (ORC-12.1) should contain either the provider's license number, which must be 6 digits, or the provider's NPI number, which must be 10 digits.
- The Provider's Family/Last Name (ORC-12.2.1) and Given/First Name (ORC-12.3) must each be 25 characters or less.
- The Identifier Type Code (ORC-12.13) should be valued with "LN" when sending the provider's license number and "NPI" when sending the provider's NPI number; these are the HL7 suggested values from user-defined table 0203 (Identifier Type).
- Assigning Authority (ORC-12.9) should be "CMS" when a NPI number is provided or, if a license number is provided, "NYA" if New York state is the assigning authority for the provider license.
    - While Assigning Authority is a required component of the XCN data type when an ID is provided, the assigning authority component is ignored by the CIR HL7 Web Service and will not be reported as an error if omitted or incorrect.
- Other ORC-12 components, such as the Second and Further Given Names or Initials (ORC-12.4), Suffix, Prefix, and Degree, will be ignored if provided.

    Examples:
    |123456^Jones^Lisa^^^^^^NYA^^^^LN|
    |1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

If the Identifier Type Code (ORC-12.13) is missing a ValueMissing error will be reported, and the CIR will attempt to determine the identifier type based on the ID Number provided.

- A 6-digit ID Number will be considered the provider's license number.
- A 10-digit ID Number will be considered the provider's NPI number.
- If the ID Number is other than 6 or 10 digits, the ID will be considered a non-supported identifier, an additional error (BadFormat) will be reported, and the ID Number will be disregarded.

When reporting new immunization or an observation (e.g., history of disease or serological evidence of immunity), if any of the following is true the Ordering Provider will be disregarded, and the immunization will be associated with the default provider of the facility reported in RXA-11.4.1:

- ORC-12 is not valued
- ORC-12 is valued but
    - The ID Number (ORC-12.1) is other than 6 digits (numeric only) when the Identifier Type Code (ORC-12.13) is "LN"
    - The ID Number (ORC-12.1) is other than 10 digits (numeric only) when the Identifier Type Code (ORC-12.13) is "NPI"
    - The Provider's first name (ORC-12.3) or last name (ORC-12.2.1) exceeds 25 characters

- The Identifier Type Code (ORC-12.13) value is other than “LN” or “NPI”
- The Identifier Type Code (ORC-12.13) is not valued, and the ID Number (ORC-12.1) is other than 6 or 10 digits (numeric only)

The corresponding non-fatal errors will be reported in the ACK to inform the HL7 Partner that the Ordering Provider information could not be absorbed, and a default provider was associated with the immunization or observation. Generally, the CIR will maintain a record of a default provider for every facility; however, *if a default provider has not been established for a facility a fatal UnknownKeyIdentifier error will be returned, and the Order Group will be rejected.*

If the RXA segment is reporting a historical immunization (indicated by the code provided in RXA-9) and ORC-12 is not valued, the immunization will still be associated with the default provider for the facility; however, no error will be reported (as long as a default provider has been established for the facility). Non-fatal errors will be reported if ORC-12 is valued but contains errors (i.e., ID Number other than 6 or 10 digits, Identifier Type Code other than NPI or LN, ID Number provided but Identifier Type Code not valued, etc.). Generally, the CIR will maintain a record of a default provider for every facility; however, *if a default provider has not been established for a facility a fatal UnknownKeyIdentifier error will be returned and the RXA segment will be rejected.*

ORC-12 will be ignored when the Order Group represents a delete request (indicated by a “D” in RXA-21).

In 2.3.1 messages the only provider that the CIR HL7 Web Service accepts in RXA-10 is the Ordering (OEI) provider. In 2.5.1 message the ordering provider should be sent in ORC-12.

TQ1—Timing/Quantity Segment

If present, the entire TQ1 segment is ignored by the CIR HL7 Web Service.

TQ2—Timing/Quantity Segment

If present, the entire TQ2 segment is ignored by the CIR HL7 Web Service.

RXA—Pharmacy/Treatment Administration Segment

The RXA segment carries pharmacy administration data. It is a child of an ORC segment. **Every RXA must be associated with (preceded by) an ORC; otherwise, the message will be rejected.**

Each RXA must be associated with one ORC, based on HL7 2.5.1 standard; this is a change from the 2.3.1 standard. In the 2.3.1 standard the ORC is optional and, in fact, rarely included in a VXU.

Table 4-6 Pharmacy/Treatment Administration (RXA) in a VXU

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Give Sub-ID Counter	NM		[1..1]	[1..1]	R	RE
2	Administration Sub-ID Counter	NM		[1..1]	[1..1]	R	RE
3	Date/Time Start of Administration	TS_NZ		[1..1]	[1..1]	R	R
4	Date/Time End of Administration	TS		[0..1]	[0..1]	RE	RE
5	Administered Code	CE	0292	[1..1]	[1..1]	R	R
6	Administered Amount	NM		[1..1]	[1..1]	R	RE

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
7	Administered Units	CE		[0..1]	[1..1]	CE	C(RE/O)
8	Administered Dosage Form	CE		[0..1]	[0..1]	O	O
9	Administration Notes	CE	NIP 0001	[0..*]	[0..1]	RE	RE
10	Administering Provider	XCN		[0..1]	[0..1]	RE	RE
11	Administered-at Location	LA2		[0..1]	[1..1]	RE	R
12	Administered Per (Time Unit)	ST		[0..1]	[0..1]	O	O
13	Administered Strength	NM		[0..1]	[0..1]	O	O
14	Administered Strength Units	CE		[0..1]	[0..1]	O	O
15	Substance Lot Number	ST		[0..*]	[0..1]	RE	RE
16	Substance Expiration Date	TS		[0..1]	[0..1]	CE	RE
17	Substance Manufacturer Name	CE	0227	[0..*]	[0..1]	RE	RE
18	Substance/Treatment Refusal Reason	CE		[0..*]	[0..*]	C	O
19	Indication	CE		[0..1]	[0..1]	O	O
20	Completion Status	ID	0322	[0..1]	[0..1]	RE	RE
21	Action Code - RXA	ID	0323	[0..1]	[0..1]	RE	RE
22	System Entry Date/Time	TS		[0..1]	[0..1]	O	O
23	Administered Drug Strength Volume	NM		[0..1]	[0..1]	O	O
24	Administered Drug Strength Volume Units	CWE		[0..1]	[0..1]	O	O
25	Administered Barcode Identifier	CWE		[0..1]	[0..1]	O	O
26	Pharmacy Order Type	ID	0480	[0..1]	[0..1]	O	O

RXA Field Usage Notes

RXA-1 Give Sub-ID Counter (NM)

Per the CDC IG, this field is used to match an RXA and RXG, which is not a function under IIS, and is constrained to 0 (zero).

Although required by the CDC IG, this field is ignored by the CIR HL7 Web Service and will not be reported as an error if omitted.

RXA-2 Administration Sub-ID Counter (NM)

Per the CDC IG, this field is used to track multiple RXA segments under an ORC and, since each ORC has only one RXA in immunization messages, the value should be constrained to 1. This field should not be used for indicating dose number, which belongs in an OBX.

Although required by the CDC IG, this field is ignored by the CIR HL7 Web Service and will not be reported as an error if omitted.

RXA-3 Date/Time Start of Administration (TS_NZ)

This field conveys the date the vaccination occurred. When reporting (or deleting) an immunization, **this is a required field.**

The date must be a valid date in the YYYYMMDD format and cannot be a future date or prior to the patient's date of birth; otherwise, it will be considered a fatal error. The time component will be ignored if it is provided.

When reporting (or deleting) serological evidence of immunity or history of disease as evidence of immunity, RXA-3 is ignored by the CIR HL7 Web Service.

RXA-4 Date/Time End of Administration (If Applies) (TS)

Per the CDC IG, in the context of an immunization, this is equivalent to the Start Date/Time and, if populated, should contain the same value as RXA-3. If empty, the date/time of RXA-3 (Date/Time Start of Administration) is assumed to be the administration date/time.

While this field has a usage of RE (required, but may be empty) per the CDC IG, the CIR HL7 Web Service will ignore this field if valued.

RXA-5 Administered Code (CE)

This field identifies the medical substance administered. **This is a required field. CVX/NDC accepted combinations:**

- NYC CIR prefers that CVX be reported first, but also accepts NDC if submitted first as well
- If CVX is incorrect and NDC is present, CVX will be derived.
- The following four combinations are accepted:
  - |CVX code^description^CVX|
  - |NDC code^description^NDC|
  - |NDC code^description^NDC^CVX code^description^NDC|
  - |CVX code^description^CVX^NDC code^description^CVX|

The CIR Web service will continue to accept CVX codes, but NDC codes are now supported alone or after CVX codes in the following formats:

1. 11-digit format with dashes
2. 10-digit format with dashes, in 4-4-2 format
3. 10-digit format with dashes, in 5-3-2 format
4. 10-digit format with dashes, in 5-4-1 format
5. 11-digit format without dashes

If an NDC code is submitted with a CVX code, the CIR HL7 web service will check that they are properly mapped to one another. If the mapping is incorrect, the CIR will store the CVX code and return a warning about the mismatch.

When reporting an evidence of immunity observation RXA-5 should be populated with "998" (no vaccine administered).

If there are errors within an Order Group that make it unclear whether the Order Group is being sent to report/delete *an immunization* or whether the Order Group is being sent to report/delete *an evidence of immunity observation*, the CIR HL Web Service will consider that the Order Group is attempting to report/delete *an immunization* and will return errors accordingly.

- The CVX codes accepted by the CIR HL7 Web Service as of the publication date of this IG are provided in HL7-defined Table 0292 in Appendix A of this IG. However, as new codes are needed and added by the CDC, the table in Appendix A will become out of date. New codes added to the CDC's website **after this IG was published may also be accepted by the CIR HL7 Web Service. The following two links provide access to the current:**
  - CDC CVX Code Update Table

- CDC CVX-NDC Crosswalk Table

Note: As noted in the Reporting Immunizations section, most immunizations only allow one submission of a particular CVX code for a patient on the same day. There is an exception for CVX 307 (For additional details, see section: Reporting Two Doses of CVX Code 307 to CIR).

RXA-6 Administered Amount (NM) 00348

This field reports the amount of pharmaceutical administered. The units are expressed in the next field, RXA-7. Registries that do not collect the administered amount should record the value “999” in this field. Numeric values up to 1500 (1500 units) will be stored. If the contents of RXA-6 are anything other than numbers or greater than 1500, will be ignored but not trigger a warning.

RXA-7 Administered Units (CE)

The Administered Units field is conditional; it is required if the administered amount code (in RXA-6) does not imply units. This field is not required if the previous field is populated with 999. Any value will be accepted. UCUM values are preferred, e.g., ML.

RXA-9 Administration Notes (CE) 00351

This field is used to indicate whether this immunization record is based on a historical record or was given by the reporting provider. It should contain the information source (from CDC-defined Table NIP001 - Immunization Information Source). The CIR HL7 Web Service accepts all but one of the immunization information source codes in table NIP001. Those codes are listed below for convenience:

- 00 – New immunization record
- 01 – Historical information, source unspecified
- 02 – Historical information, from other provider
- 03 – Historical information, from parent’s or patient’s written record
- 05 – Historical information, from other registry
- 06 – Historical information, from birth certificate
- 07 – Historical information, from school record
- 08 – Historical information, from public agency

The CIR no longer accepts 04 – Historical information, from parent’s or patient’s recall.

The first component (RXA-9.1) shall contain the code, the second (RXA-9.2) the free text, and the third (RXA-9.3) shall contain the name of the code system (NIP001). Although this field has a usage of RE (required, but may be empty), the CDC IG states that sending systems should be able to send this information.

The Immunization Information Source must be one of the valid codes listed above; otherwise, the Immunization Information Source will be inferred based on the CIR’s business rules. The CIR database always stores an information source with every immunization.

RXA-10 Administering Provider (XCN) 00352

This field is intended to contain the name and provider ID of the person physically administering the pharmaceutical.

For 2.3.1 messages, the CDC IG allowed the administering provider, ordering provider (used by the CIR HL7 Web Service) and recording provider to be reported in RXA-10; this is no longer supported for 2.5.1 messages.

For 2.5.1 messages, RXA-10 should be used to report the administering provider only. The person who ordered the immunization and who entered the record should be reported in the associated ORC segment. The CIR HL7 Web Service will look for the ordering provider in ORC-12.

The CIR currently stores only the ordering provider (and not the administering provider); therefore, while this field has a usage of RE (required, but may be empty) per the CDC IG, the CIR HL7 Web Service will ignore this field if valued.

HL7 Data Exchange Partners should report the Administering Provider, if known, when sending a VXU. In an upcoming enhancement, the CIR HL7 Web Service will be modified to capture this field.

RXA-11 Administered-at Location (LA2)

This field is used to report the facility that administered or recorded the immunization. Although this field has a usage of RE (required, but may be empty) by the CDC IG, the CIR requires this field. **A CIR-issued facility code is required in RXA-11.4.1 when reporting new or historical immunizations.** Failure to provide a valid CIR-issued facility code will result in a fatal error.

For a new immunization, the CIR-issued facility code of the facility at which the immunization was administered must be in RXA-11.4.1, the first position (i.e., the Namespace ID position) of the fourth component (i.e., the Facility HD component) of this field.

For a historical immunization, the HL7 data exchange partner must provide their CIR-issued facility code in RXA-11.4.1 (as described above), indicating the location recording the historical immunization.

When reporting observations, such as history of disease as evidence of immunity or serological evidence of immunity, the HL7 data exchange partner must also provide their CIR-issued facility code in RXA-11.4.1 (as described above), indicating the location recording the observation.

RXA-15 Substance Lot Number (ST)

This field contains the lot number of the medical substance administered. **When the HL7 Data Exchange Partner knows the lot number, this field should be valued.**

The CIR HL7 Web Service will process and store the lot number, if sent, and will not raise an error if omitted.

The CIR currently does not store multiple lot numbers; therefore, the CIR HL7 Web Service does not allow this field to repeat. If multiple lot numbers are sent, only the first lot number will be absorbed.

The lot number is the number printed on the label attached to the container holding the substance and, on the packaging, which houses the container. Two lot numbers may need to be reported if two lots are associated with a product that is a combination of different components. HL7 Data Exchange Partners should report both lot numbers, when necessary. In an upcoming enhancement, the CIR HL7 Web Service will be modified to capture both lot numbers. The first repetition should always be the vaccine.

The Lot Number cannot exceed 16 characters; otherwise, it will be disregarded, and a non-fatal error reported.

RXA-16 Substance Expiration Date (TS_M)

This field contains the expiration date of the medical substance administered. **When the HL7 Data Exchange Partner knows the substance expiration date, this field should be valued.**

The CIR HL7 Web Service will process and store the expiration date, if sent, and will not raise an error if omitted. The CIR HL7 Web Service will accept an expiration date even if the corresponding lot number is not provided.

Since vaccine expiration date does not always have a “day” component, the date must be a valid date in either the YYYYMMDD or the YYYYMM format; otherwise, it will be disregarded, and a non-fatal error reported. If sent in the YYYYMM format the CIR will translate and store the day as the last day of the given month. The time component will be ignored if it is provided.

RXA-17 Substance Manufacturer Name (CE)

This field contains the manufacturer of the medical substance administered. **When the HL7 Data Exchange Partner knows the manufacturer name, this field should be valued.**

The CIR HL7 Web Service will process and store manufacturer, if sent, and will not raise an error if RXA-17 is omitted.

When sending the manufacturer, RXA-17.1 must contain the corresponding HL7 MVX code and RXA-17.3 should contain the code type (MVX).

The MVX codes accepted by the CIR HL7 Web Service as of the publication date of this IG are provided in HL7-defined Table 0227 in Appendix A of this IG. However, as new codes are needed and added by the CDC, the table in Appendix A will become out of date. New codes added to the CDC’s website (**http://www2a.cdc.gov/vaccines/IIS/IISStandards/vaccines.asp?rpt=mvx may also be accepted by the CIR HL7 Web Service.**

If the value in RXA-17.1 is other than one of the MVX codes accepted by the CIR a non-fatal error will be reported and the manufacturer will be stored as “Unknown” (UNK). If the code type is missing or other than “MVX” the HL7 Web Service will still attempt to match the code provided in RXA-17.1 to one of the MVX codes that the CIR supports. If RXA-17.3 is valued but RXA-17.1 is omitted, a non-fatal “ValueMissing” error will be reported.

RXA-18 Substance/Treatment Refusal Reason (CE) 01136

This field is intended to be used to report the reason the patient refused the medical substance/treatment. The CIR currently does not capture vaccine refusals (or the corresponding refusal reason); therefore, although this field has a usage of RE (required, but may be empty) by the CDC IG, the CIR HL7 Web Service ignores this field.

RXA-20 Completion Status (ID) 01223

This field indicates if the dose was successfully given.

When reporting a successfully given dose, RXA-20 should be valued with the completion status code of “CP” for Complete. If RXA-20 is not valued, a value of CP will be assumed, and no error will be reported for the missing value.

When reporting an evidence of immunity observation, RXA-20 must be valued with a completion status code of “NA” for Not Administered. A completion status of “NA” is only allowed when RXA-5 is valued with “998” (no vaccine administered). If RXA-20 is valued with “NA” but RXA-5 is valued with a value other than “998” (no vaccine administered) a Table_Value_Not_Found error will be reported.

If RXA-20 is valued with a value other than “CP”, “RE”, “PA”, or “NA” a Table_Value_Not_Found error will be reported for that RXA segment and the entire Order Group will be disregarded.

When a VXU is sent to report immunizations or observations, the VXU message must contain at least one accepted Order Group (i.e., ORC/RXA pair reporting a successfully given dose or ORC/RXA/OBX combination reporting an observation of evidence of immunity). If there are no additional, accepted Order Groups, then these Table_Value_Not_Found errors become fatal and the message is rejected.

If there are errors within an Order Group (corresponding ORC, RXA, and OBX segments) that make it unclear whether the Order Group is being sent to report/delete *an immunization* or whether the Order Group is being sent to report/delete *an evidence of immunity observation*, the CIR HL Web Service will consider that the Order Group is attempting to *report an immunization* and will return errors accordingly.

RXA-21 Action Code – RXA (ID) 01224

HL7 Data Exchange Partners should use this field to indicate the purpose of the RXA segment.

Set the value of this field to the HL7 code “A” (for Add) to report an immunization to the CIR.

Set the value of this field to the HL7 code “D” (for Delete) to request that the CIR delete an immunization or evidence of immunity observation that the HL7 data exchange partner had previously reported. If a delete is submitted for a patient that does not exist, the CIR will return a non-fatal error in the ACK message that the vaccine was not found. The CIR will also create a new patient record with no immunizations.

Set the value of this field to the HL7 code “U” (for Update) to report an update to an immunization (i.e. a change to a Lot Number). If the CIR does not have an existing immunization to update the CIR will add the immunization as if the HL7 code was reported as “A”.

If this field is omitted or is set to anything other than “A”, “U”, “D”, then it will be assumed that the purpose is to report an immunization or evidence of immunity observation and the CIR HL7 Web Service will process the VXU message as such; a non-fatal error will be reported to indicate that the expected value of “A”, “U”, “D” was missing.

RXR—Pharmacy/Treatment Route Segment

The Pharmacy/Treatment Route segment contains information about the route, administration site and other administration information for a particular order.

Table 4-7 Pharmacy/Treatment Route Segment (RXR) in a VXU

SEQ	Element Name	Data Type	Value Sets	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Route	CE	NCIT or 0162	[1..1]	[1..1]	R	RE
2	Administration Site	CWE	0163	[0..1]	[1..1]	RE	RE
3	Administration Device	CE				O	O
4	Administration Method	CWE				O	O
5	Routing Instruction	CE				O	O
6	Administration Site Modifier	CWE				O	O

RXR Field Usage Notes

RXR-1 Route

This field contains the route of administration. CIR HL7 Web Service accepts both NCI Thesaurus (NCIT) codes and HL7 Route of Administration codes in OBX-1 but will only store NCIT values. If RXR-1 contains an invalid value, the CIR HL7 Web Service will ignore the field and return a non-fatal error.

RXR-2 Administration Site

This field contains the site of administration. If RXR-2 contains an invalid value, the CIR HL7 Web Service will ignore the fields and return a non-fatal error.

OBX—Observation Result Segment

The observation result segment has many uses. It carries observations about the object of its parent segment. In the VXU it is associated with the RXA or immunization record. The basic format is a question (OBX-3) and an answer (OBX-5).

For VXU messages, the CIR HL7 Web Service will accept OBX segments that convey the following information:

- Immunization-level Vaccines for Children (VFC) eligibility
- Vaccine funding source
- Diseases with serological evidence of immunity
- History of disease as evidence of immunity
- Reporting patient gender identity
- Reporting patient Sexual orientation

- Covid: when reporting vaccine associated with public health emergency event (Added as a response to the COVID-19 Pandemic)
- Covid: when reporting priority group (Added as a response to the COVID-19 Pandemic)

All other OBX segments will be ignored.

When the HL7 Data Exchange Partner knows this information, a corresponding OBX should be sent.

Table 4- Observation Segment (OBX) in a VXU

SEQ	Element Name	Data Type	Value Sets	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Set ID – OBX	SI		[1..1]	[1..1]	R	RE
2	Value Type	ID	0125	[1..1]	[1..1]	R	RE
3	Observation Identifier	CE		[1..1]	[1..1]	R	R
4	Observation Sub-ID	ST		[1..1]	[1..1]	RE	RE
5	Observation Value	varies		[1..1]	[1..1]	R	R
6	Units	CE		[0..1]	[0..1]	CE	C(RE/O)
7	References Range	ST		[0..1]	[0..1]	O	O
8	Abnormal Flags	IS	0078	[0..1]	[[0..1]	O	O
9	Probability	NM		[0..1]	[0..1]	O	O
10	Nature of Abnormal Test	ID	0080	[0..1]	[0..1]	O	O
11	Observation Result Status	ID	0085	[1..1]	[1..1]	R	RE
12	Effective Date of Reference Range Values	TS		[0..1]	[0..1]	O	O
13	User Defined Access Checks	ST		[0..1]	[0..1]	O	O
14	Date/Time of the Observation	TS		[1..1]	[1..1]	R	R
15	Producer's Reference	CE		[0..1]	[0..1]	O	O
16	Responsible Observer	XCN		[0..1]	[0..1]	O	O
17	Observation Method	CE		[0..1]	[0..1]	O	O
18	Equipment Instance Identifier	EI		[0..1]	[0..1]	O	O
19	Date/Time of the Analysis	TS		[0..1]	[0..1]	O	O
20	Reserved for harmonization with V2.6			[0..1]	[0..1]	O	O
21	Reserved for harmonization with V2.6			[0..1]	[0..1]	O	O
22	Reserved for harmonization with V2.6			[0..1]	[0..1]	O	O
23	Performing Organization Name	XON		[0..1]	[0..1]	O	O
24	Performing Organization Address	XAD		[0..1]	[0..1]	O	O
25	Performing Organization Medical Director	XCN		[0..1]	[0..1]	O	O

OBX Field Usage Notes

OBX-1 Set ID - OBX (SI)

This field contains the sequence number. For each OBX under an RXA, the CIR HL7 Data Exchange Partner should value the first OBX with “1” and each subsequent OBX with the next number in sequence.

OBX-1 is required by the CDC IG; however, the CIR HL7 Web Service ignores this field.

OBX-2 Value Type (ID)

When reporting immunization-level Vaccines for Children (VFC) eligibility, history of disease, or serological evidence of immunity, this field should be valued with “CE” since the OBX-5 value will be a coded entry.

If OBX-2 is not valued or contains a value other than “CE”, the CIR HL7 Web Service will ignore this field and process the OBX as if a “CE” had been sent.

OBX-3 Observation Identifier (CE)

This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). OBX-3 may be thought of as a question that the observation (OBX-5) answers.

For VXU messages, the CIR HL7 Web Service will only process OBX segments that convey vaccine funding program eligibility, history of disease as evidence of immunity, or serological evidence of immunity. All other OBX segments will be ignored.

OBX-3.1 is required when an OBX segment is sent. If OBX-3.1 is not valued a “ValueMissing” error will be reported and the observation within the OBX will be disregarded. OBX-3.1 should be populated with one of the following LOINC codes.

- 64994-7 when reporting vaccine funding program eligibility
- 30963-3 when reporting vaccine funding source
- 59784-9 when reporting history of disease as evidence of immunity
- 75505-8 when reporting serological evidence of immunity
- 76691-5 when reporting patient gender identity
- 76690-7 when reporting patient sexual orientation

For COVID-19 reporting only: (Added as a response to the COVID-19 Pandemic)

- 90064-7 when reporting vaccine associated with public health emergency event
- 95715-9 when reporting priority group

All other LOINC codes will be ignored.

OBX-3.2 (human-readable description) and OBX-3.3 (code type) are ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-3 content.

> When sending an evidence of immunity observation, remember that RXA-5 must be valued with “998” (no vaccine administered) and RXA-20 must be valued with “NA” (not administered).

Vaccine Funding Program Eligibility

When an OBX is sent to convey immunization-level vaccine funding program eligibility, (e.g., VFC eligibility for the vaccine reported in RXA-5), OBX-3.1 must contain LOINC Code 64994-7.

Example:
|64994-7^vaccine fund pgm elig cat^LN|

For each RXA, the CIR HL7 Web Service will obtain the funding program eligibility status from the first successful OBX conveying VFC eligibility (i.e., “64944-7” in OBX-3.1 and a supported HL7 Financial

Code in OBX-5.1). The CIR HL7 Web Service will ignore VFC eligibility provided in any additional OBX segments associated with that RXA.

Vaccine Funding Source

When an OBX is sent to convey the vaccine funding source, (e.g., the funding that paid for the vaccine that was administered), OBX-3.1 must contain LOINC Code 30963-3.

Example:
|30963-3^vaccine funding source^LN|

For each RXA, the CIR HL7 Web Service will obtain the vaccine funding source from the first successful OBX conveying the vaccine funding source (i.e., “30963-3” in OBX-3.1 and a supported HL7 Immunization Funding Source code in OBX-5.1). The CIR HL7 Web Service will ignore vaccine funding source data provided in any additional OBX segments associated with that RXA.

History of Disease as Evidence of Immunity

History of disease as evidence of immunity indicates that a person has been diagnosed with a particular disease.

When an OBX is sent to convey history of disease as evidence of immunity, OBX-3.1 must contain LOINC Code 59784-9.

Example:
|59784-9^Disease with presumed immunity^LN|

The CIR HL7 Web Service accepts multiple OBX segments reporting immunity within a single VXU. When reporting immunity for multiple diseases within a single VXU, one OBX should be submitted per Order Group/RXA. See Appendix B for an example of reporting immunity in a VXU.

Serological Evidence of Immunity

Serological evidence of immunity indicates serology confirmed immunity to a particular disease.

When an OBX is sent to convey serological evidence of immunity, OBX-3.1 must contain LOINC Code 75505-8.

Example:
|75505-8^Diseases with serological evidence of immunity^LN|

The CIR HL7 Web Service accepts multiple OBX segments reporting immunity within a single VXU. When reporting immunity for multiple diseases within a single VXU, one OBX should be submitted per Order Group/RXA. See Appendix B for an example of reporting immunity in a VXU.

Gender Identity

Gender identity indicates the gender identity of the patient. Note, gender identity is different from administrative sex, which is captured in PID-8.

When an OBX is sent to convey patient gender identity, OBX-3.1 must contain LOINC code 76691-5.

Example:
|76691-5^Gender Identity^LN|

The CIR HL7 Web Service recommends reporting gender identity as an OBX segment associated with the COVID-19 immunization event (i.e., Order Group/RXA). Only one OBX should be submitted per Order Group/RXA. If multiple OBX segments are reporting gender identity within a single VXU, the HL7 Web Service shall store the gender identity associated with the last OBX segment.

Sexual Orientation

Sexual orientation indicates the sexual orientation of the patient. Note, sexual orientation is different from administrative sex, which is captured in PID-8.

When an OBX is sent to convey patient sexual orientation, OBX-3.1 must contain LOINC code 76690-7.

Example:
|76690-7^Sexual Orientation^LN|

The CIR HL7 Web Service recommends reporting sexual orientation as an OBX segment associated with the COVID-19 immunization event (i.e., Order Group/RXA). Only one OBX should be submitted per Order Group/RXA. If multiple OBX segments are reporting sexual orientation within a single VXU, the HL7 Web Service shall store the sexual orientation associated with the last OBX segment.

COVID-19 Reporting: Public Health Emergency Event

Designation of public health emergency event indicates that an immunization event is associated with a public health emergency. This information is only required when reporting COVID-19 immunizations.

When an OBX is sent to indicate a vaccine was administered in context of a public health emergency, OBX-3.1 must contain LOINC code 90064-7.

The CIR HL7 Web Service accepts multiple OBX segments reporting public health emergency events within a single VXU. When reporting public health emergency events for multiple diseases within a single VXU, one OBX should be submitted per Order Group/RXA.

Example:

|90064-7^Public health emergency event name^LN|

COVID-19 Reporting: Priority Group

Priority group is a demographic (e.g., >=65 years) or occupation group (e.g., healthcare worker) that reflects a person's recommended priority to receive an immunization. This information is only required when reporting COVID-19 immunizations.

When an OBX is sent to convey priority group, OBX-3.1 must contain LOINC code 95715-9.

The CIR HL7 Web Service accepts multiple OBX segments reporting priority group within a single VXU. While OBX segments for priority group can be submitted for an immunization event, the CIR HL7 Web Service will only store the first priority group associated with an Order Group/RXA.

Example:

|95715-9^Population group^LN|

OBX-4 Observation Sub-ID (ST)

This field is used to group related observations by setting the value to the same number.

Since the OBX reported data that the CIR HL7 Web Service currently supports in a VXU message requires a single OBX to report the data, rather than paired or multiple OBX segments, the CIR HL7 Web Service will ignore this field.

OBX-5 Observation Value (varies)

This field contains the observation (answer) posed by the question in OBX-3 (Observation Identifier). OBX-2 (Value Type) contains the data type for this field.

For VXU messages, the CIR HL7 Web Service will only process OBX segments that convey one of the following observations:

- Immunization-level vaccine funding program eligibility
- Vaccine funding source
- History of disease as evidence of immunity
- Serological evidence of immunity
- Gender Identity
- Sexual Orientation

For COVID-19 reporting only

- Public health emergency event
- Priority group

All other OBX segments will be ignored.

OBX-5.1 is required when an OBX segment is sent.

> When sending an evidence of immunity observation, remember that RXA-5 must be valued with "998" (no vaccine administered) and RXA-20 must be valued with "NA" (not administered).

Vaccine Funding Program Eligibility

When an OBX is sent to convey immunization-level vaccine funding program eligibility, (e.g., VFC eligibility for the vaccine reported in RXA-5), OBX-5.1 should contain one of the HL7 Financial Class (VFC eligibility) codes that the CIR database supports.

Example:
|V04^VFC eligible-American Indian/Alaskan Native^HL70064|

The CIR HL7 Web Service does not support all the codes in the HL7 Financial Class table 0064; see the Financial – VFC Eligibility table in Appendix A of this document for the valid HL7 values supported by the CIR database.

If OBX-5.1 contains an invalid code or one not supported by the CIR, a TableValueNotFound non-fatal error will be reported and the observation within the OBX will be ignored.

For each RXA, the CIR HL7 Web Service will obtain the status from the first successful OBX conveying VFC eligibility (i.e., "64944-7" in OBX-3.1 and a supported HL7 Financial Code in OBX-5.1). The CIR HL7 Web Service will ignore VFC eligibility provided in any additional OBX segments associated with that RXA.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Vaccine Funding Source

When an OBX is sent to convey the vaccine funding source, OBX-5.1 should contain one of the following codes from the PHVS Immunization Funding Source (IIS) value set.

Code	Label	Definition
PHC70	Private	vaccine stock used was privately funded
VXC50	Public	vaccine stock used was publicly funded
VXC51	Public VFC	vaccine stock used was publicly funded by VFC program
VXC52	Public Non-VFC	vaccine stock used was publicly funded b VFC program

If OBX-5.1 contains an invalid code or one not supported by the CIR, a TableValueNotFound non-fatal error will be reported and the observation within the OBX will be ignored.

For each RXA, the CIR HL7 Web Service will obtain the funding source from the first successful OBX conveying the vaccine funding source (i.e., “30963-3” in OBX-3.1 and a supported HL7 Immunization Funding Source code in OBX-5.1). The CIR HL7 Web Service will ignore vaccine funding sources provided in any additional OBX segments associated with that RXA.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

History of Disease as Evidence of Immunity

When an OBX is sent to convey history of disease as evidence of immunity, OBX-5.1 should contain one of the SNOMED codes from the PHVS value set History of Disease as Evidence of Immunity (IIS) value set.

Example:
|38907003^HISTORY OF VARICELLA INFECTION^SCT|

The CIR does not support all the codes in the PHVS History of Disease as Evidence of Immunity value set. The CIR currently accepts only history of varicella as evidence of immunity (code 38907003).

If OBX-5.1 contains an invalid code or a PHVS History of Disease as Evidence of Immunity (IIS) code other than 38907003, a non-fatal TableValueNotFound error will be reported. If OBX-5.1 is not valued a non-fatal ValueMissing error will be returned. Since a valid OBX-5.1 value is required, a fatal RequiredField error will also be reported, and the observation will be disregarded.

The CIR HL7 Web Service accepts multiple OBX segments reporting immunity within a single VXU. When reporting immunity for multiple diseases within a single VXU, one OBX should be submitted per Order Group/RXA. See Appendix B for an example of reporting immunity in a VXU.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Serological Evidence of Immunity

When an OBX is sent to convey serological evidence of immunity, OBX-5.1 should contain one of the SNOMED codes from the PHVS Serological Evidence of Immunity (IIS) value set.

Example:
|271511000^SEROLOGY CONFIRMED HEPATITIS B^SCT|

The CIR HL7 Web Service accepts all codes contained in this value set as of the date of this IG. For convenience, the table below lists those codes.

Concept Code	Concept Name	Concept Description
278971009	Hepatitis A immune (finding)	Serology confirmed hepatitis A
271511000	Hepatitis B immune (finding)	Serology confirmed hepatitis B
371111005	Measles immune (finding)	Serology confirmed measles
371112003	Mumps immune (finding)	Serology confirmed mumps
278968001	Rubella immune (finding)	Serology confirmed rubella
371113008	Varicella immune (finding)	Serology confirmed varicella

As new codes are added to the value set, support for those codes will need to be added to the CIR HL7 Web Service.

If OBX-5.1 contains an invalid code or a PHVS Serological Evidence of Immunity (IIS) code not listed above (i.e., a new code that has not yet been added to the CIR HL7 Web Service), a non-fatal TableValueNotFound error will be reported. If OBX-5.1 is not valued a non-fatal ValueMissing error will be returned. Since a valid OBX-5.1 value is required, a fatal RequiredField error will also be reported, and the observation will be disregarded.

The CIR HL7 Web Service accepts multiple OBX segments reporting immunity within a single VXU. When reporting immunity for multiple diseases within a single VXU, one OBX should be submitted per Order Group/RXA. See Appendix B for an example of reporting immunity in a VXU.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Gender Identity

When an OBX is sent to indicate gender identity, OBX-5.1 should contain supported values in the Gender Identity table found in Appendix A.

If OBX-5.1 contains an invalid value, the CIR HL7 Web Service SHALL ignore the OBX segment.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Example:

|NB^Non-binary person^CIR|

Sexual Orientation

When an OBX is sent to indicate sexual orientation, OBX-5.1 should contain supported values in the sexual orientation able found in Appendix A.

If OBX-5.1 contains an invalid value, the CIR HL7 Web Service SHALL ignore the OBX segment.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Example:

|QUR^Queer^STC|

COVID-19 Reporting: Public Health Emergency Event

For reporting of COVID-19 immunization events, when an OBX is sent to indicate a public health emergency event, OBX-5.1 should contain 'COVID19'

If OBX-5.1 contains a value other than 'COVID19', the CIR HL7 Web Service shall still accept and store other values.

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Example:

|COVID19^^CIR|

COVID-19 Reporting: Priority Group

When an OBX is sent to indicate priority group, OBX-5.1 should contain supported values in the Priority Group table found in Appendix A.

If OBX-5.1 contains an invalid value, the CIR HL7 Web Service SHALL return a non-fatal error and map the OBX-5.1 value to "Other."

OBX-5.2 (human-readable description) and OBX-5.3 (code type) will be ignored by the CIR HL7 Web Service; however, these are important for human review of OBX-5 content.

Example:

|W29-1^Healthcare/Hospital Staff^CIR|

OBX-11 Observation Result Status (ID)

This field contains the observation result status. The expected value is F for final.

If OBX-11 is blank or contains a value other than "F", OBX-11 will be treated as if "F" was sent, and no error will be reported.

OBX-14 Date/Time of the Observation (TS_NZ)

This field represents the time of the observation. It is the physiologically relevant date-time or the closest approximation to that date-time of the observation.

OBX-14 is required by the CDC IG; however, the CIR HL7 Web Service ignores this field except for OBX segments reporting (or deleting) history of disease as evidence of immunity or serological evidence of immunity.

When reporting history of disease as evidence of immunity or serological evidence of immunity, OBX-14 is a required field and should be populated in the YYYYMMDD format with the date the disease was diagnosed or the date of the test, depending on the evidence of immunity being reported. If OBX-14 is not valued or contains a bad value, (e.g., a date in the future, a date that is prior to the patient's date of birth, a bad date format, or an invalid date), then the error(s) will be reported and the OBX segment will be disregarded. When reporting/deleting immunizations or evidence of immunity observations, the VXU message must contain at least one successful Order Group; otherwise, the message will be rejected.

NTE—Note Segment

If present, the entire NTE segment is ignored by the CIR HL7 Web Service.

5. Query By Parameter (QBP)

Overview

The CIR HL7 Web Service supports querying the CIR for a patient's immunization history and immunization recommendations using both Z34 and Z44 profile for QBP messages. The CIR HL7 Web Service supports the processing of QBP messages via the QueryPatientImmRecords operation. This operation takes as input an HL7 formatted QBP message using the Z34 query profile as described in the sections below. This operation always returns one of two message types in response to a QBP message – an RSP (using the Z32 profile) or, if the QBP is malformed and cannot be parsed, an ACK.

QBP Message Segments

MSH—Message Header Segment

This is a required segment.

Table 5-1 Message Header Segment (MSH) in a QBP

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Field Separator	ST		[1..1]	[1..1]	R	R
2	Encoding Characters	ST		[1..1]	[1..1]	R	R
3	Sending Application	HD	0361	[0..1]	[0..1]	RE	RE
4	Sending Facility	HD	0362	[0..1]	[1..1]	RE	R
5	Receiving Application	HD	0361	[0..1]	[0..1]	RE	RE
6	Receiving Facility	HD	0362	[0..1]	[0..1]	RE	RE
7	Date/Time Of Message	TS_Z		[1..1]	[1..1]	R	R
8	Security	ST		[0..1]	[0..1]	O	O
9	Message Type	MSG		[1..1]	[1..1]	R	R
10	Message Control ID	ST		[1..1]	[1..1]	R	R
11	Processing ID	PT		[1..1]	[1..1]	R	R
12	Version ID	VID		[1..1]	[1..1]	R	R
13	Sequence Number	NM		[0..1]	[0..1]	O	O
14	Continuation Pointer	ST		[0..1]	[0..1]	O	O
15	Accept Acknowledgement Type	ID	0155	[0..1]	[0..1]	RE	RE
16	Application Acknowledgment Type	ID	0155	[0..1]	[0..1]	RE	RE
17	Country Code	ID	0399	[0..1]	[0..1]	O	O
18	Character Set	ID	0211	[0..1]	[0..1]	O	O
19	Principal Language Of Message	CE		[0..1]	[0..1]	O	O
20	Alternate Character Set Handling Scheme	ID	0356	[0..1]	[0..1]	O	O
21	Message Profile Identifier	EI		[0..*]	[0..1]	O	RE
22	Sending Responsible Organization	XON	0362	[0..1]	[0..1]	RE	RE

MSH Field Usage Notes

MSH-1 Field Separator (ST)

This field contains the separator between the segment ID and the first real field, MSH-2-encoding characters. As such it serves as the separator and defines the character to be used as a separator for the rest of the message. This is a required field. **Required value is |** (ASCII 124).

Example:
MSH**|**
↑

MSH-2 Encoding Characters (ST)

This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. **This is a required field. Required values are ^~\&** (ASCII 94, 126, 92, and 38, respectively).

Special characters that are utilized within HL7 messages as separators (also referred to as delimiters) should not be included within those same HL7 messages as data because their presence would interfere with the parsing of the message. If an HL7 message does contain one of these special delimiter characters as part of the message content (e.g., an ampersand as part of an address: "Apartment A & B"), then the HL7 data exchange partner must utilize a special escape sequence to indicate that the character is a text character and not a delimiter; otherwise, the CIR HL7 Web Service cannot distinguish between the delimiter character and a character that is part of the text.

In order to include any one of these special characters as data within an HL7 message, those characters must be converted into a predefined sequence of characters that begin and end with the escape character "\". HL7 Data Exchange Partners should utilize the table below to convert special characters into escape sequences when creating outbound messages to the CIR HL7 Web Service and to convert escape sequences to special characters when parsing inbound messages from the CIR HL7 Web Service:

Special Character Description	Special Character	Escape Sequence
Escape character	\	\E\
Field separator	|	\F\
Repetition separator	~	\R\
Component separator	^	\S\
Subcomponent separator	&	\T\

Since "&" is the subcomponent separator, in the QPD-8 address field when representing "Apartment A&B", the "&" has been replaced with the escape sequence "\T\" to indicate that "&" is part of the message text, rather than a subcomponent separator:

QPD|Z34^Request Immunization History^HL70471|QT216|815^^^^MR| Smith^^Tom^^^^L|| 20081015|M|100 Main St&Main St&100^ **Apartment A\T\B** ^New York^NY^12345^^P|

MSH-3 Sending Application (HD)

This field uniquely identifies the sending application. This is not the product, but rather the name of the specific instance.

The CIR HL7 Web Service will not maintain a list of IIS applications in user-defined table 0300 and, therefore, will not limit MSH-3.1 values to the table 0300 value set.

The HL7 data exchange partner should value MSH-3.1 with the name of the sending application followed by the software version.

Example:
MSH|^~\&|**Patients First 1.1**|

MSH-4 Sending Facility (HD)

This field identifies the organization responsible for the operations of the sending application. **This is a required field.**

The HL7 data exchange partner should value MSH-4.1 with the Facility Code that was assigned by the NYC DOHMH. The value in MSH-4.1 should be the same as the Facility Code associated with the HL7 account sending the message.

If the Facility Code is not valid or does not match the Facility Code that is associated with the HL7 account that was used to connect to the CIR HL7 Web Service, it will be considered a fatal error.

The CIR HL7 Web Service will not maintain a list of facility codes in user-defined table 0300 and, therefore, will not limit MSH-4.1 values to the table 0300 value set.

The CIR HL7 Web Service also supports sending of Sending Responsible Organization in MSH-4.2. The HL7 Web Service will only process MSH-4.2 if MSH-22 is not populated or contains an invalid value.

The HL7 data exchange partners should value MSH-4.2 with a Facility Code that was assigned by the NYC DOHMH. If the Facility Code is not valued or not valid, the CIR HL7 Web Service shall ignore the MSH-4.2 segment.

MSH-5 Receiving Application (HD)

This field uniquely identifies the receiving application. This field will be ignored if sent as part of a QBP. We recommend populating this field with “NYC DOHMH”.

MSH-6 Receiving Facility (HD)

This field identifies the organization responsible for the operations of the receiving application. This field will be ignored if sent as part of a QBP. We recommend populating this field with “NYC DOHMH”.

MSH-7 Date/Time of Message (TS_Z)

This field contains the date/time that the sending system created the message. This will be used for logging. **This is a required field.** The degree of precision should be to the second. The time zone must be specified and will be used throughout the message as the default time zone.

> The time zone was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

The expected format is YYYYMMDDHHMMSS-ZZZZ.

Example:
|**20120204030159-0500**|
This represents February 4, 2012, at 3:01:59 Eastern Standard Time (EST).

Example:
|**20120710061152-0400**|
This represents July 10, 2012, at 06:11:52 Eastern Daylight Savings Time (EDT).

Additional precision, if sent, will be ignored. If the Date Time of Message is not sent or is invalid (i.e., not a valid date or not in the correct format), a fatal error will be reported.

MSH-9 Message Type (MSG)

This field contains the message type, trigger event, and the message structure ID for the message. All three components are required.

When sending a QBP, **MSH-9 must contain: |QBP^Q11^QBP_Q11|**

All other values will be considered a fatal error.

If MSH-9 is not valued or is valued with other than the expected message type and trigger event the message cannot be parsed and, therefore, will be rejected as an improperly formatted message.

> The third component, message structure ID (MSH-9.3) was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

MSH-10 Message Control ID (ST)

This field contains the identifier assigned by the sending application (MSH.3) that uniquely identifies a message instance. This identifier is unique within the scope of the sending facility (MSH.4), sending application (MSH.3), and the YYYYMMDD portion of message date (MSH.7). **This is a required field.**

The CIR HL7 Web Service will echo this ID back to the HL7 Data Exchange Partner in the Message acknowledgment segment (MSA) of the RSP response message.

MSH-11 Processing ID (PT)

This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules. **This is a required field.** Use “P” for Production and “T” for Testing, all other values will be considered a fatal error. Also, if “P” is sent for a Test message or “T” is sent for a Production message, it will be considered a fatal error.

MSH-12 Version ID (VID)

This field contains the identifier of the version of the HL7 messaging standard used in constructing, interpreting, and validating the message. **This is a required field.** Only the first component need be populated. When sending a 2.5.1 message, **value MSH-12 with “2.5.1”.**

> The only versions of HL7 that the CIR HL7 Web Service has been tested with and officially supports are 2.3.1 and 2.5.1. The CIR HL7 Web Service will reject any message that has a Version ID (MSH-12 value) other than 2.3.1 or 2.5.1.

MSH-15 Accept Acknowledgment Type (ID)

This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message. **Per the CDC IG, this field is constrained to a value of “NE”**

The CIR HL7 Web Service never sends an (accept) acknowledgement when the message is received; it only sends an (application) acknowledgement once it has processed the message.

If MSH-15 is blank or contains a value other than “NE” (Never) type, MSH-15 will be treated as if “NE” was sent, and no error will be reported.

MSH-16 Application Acknowledgment Type (ID)

This field contains the conditions under which application acknowledgments are required to be returned in response to this message.

The CIR HL7 Web Service will always send a response once it has processed the QBP message.

If MSH-16 is blank or contains a value other than “AL” (Always) type, MSH-16 will be treated as if “AL” was sent, and no error will be reported.

MSH-21 Message Profile Identifier (EI)

This field is used to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages. **In a QBP message, the expected value is “Z34^CDCPHINVS” to indicate conformance to the Z34 profile or “Z44^CDCPHINVS” to indicate conformance to the Z44 Profile. Z34 profile requests a patient’s immunization history only. Z44 profile requests both the patient’s immunization history plus CIR’s forecast and recommendations. The CIR will return immunization history plus forecast and recommendations to both profiles always.**

If MSH-21 is blank or contains a value other than “Z34^CDCPHINVS” or “Z44^CDCPHINVS”, MSH-21 shall be defaulted to the QPD-1 value.

MSH-22 Sending Responsible Organization (XON)

This field identifies the business organization that originated and is accountable for the content of the message.

The HL7 data exchange partner should value MSH-22 with a Facility Code that was assigned by the NYC DOHMH. If the Facility Code is not valid or empty, the CIR HL7 Web Service will ignore the field.

Sending Responsible Organization may also be captured in MSH-4.2.

SFT—Software Segment

If present, the entire SFT segment is ignored by the CIR HL7 Web Service.

QPD – Query Parameter Definition Segment

The QPD is a required segment that defines the parameters of the query.

Table 5-2 Query Parameter Definition (QPD) in a QBP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7Web Service Usage
1	Message Query Name	CE	0471	[1..1]	[1..1]	R	R
2	Query Tag	ST		[1..1]	[1..1]	R	R
3	Patient List	CX		[0..*]	[0..*]	RE	RE
4	Patient Name	XPN		[0..1]	[1..1]	RE	R
5	Patient Mother Maiden Name	XPN		[0..1]	[0..1]	RE	RE
6	Patient Date of Birth	TS_NZ		[0..1]	[1..1]	RE	R
7	Patient Sex	IS		[0..1]	[1..1]	RE	RE
8	Patient Address	XAD		[0..1]	[0..1]	RE	RE
9	Patient Home Phone	XTN		[0..1]	[0..1]	RE	RE
10	Patient Multiple Birth Indicator	ID		[0..1]	[0..1]	RE	RE
11	Patient Birth Order	NM		[0..1]	[0..1]	RE	RE
12	Client Last Updated Date	TS		[0..1]	[0..1]	RE	RE
13	Client Last Update Facility	HD		[0..1]	[0..1]	RE	RE

QPD Field Usage Notes

QPD-1 Message Query Name (CE)

This is a required field. This field contains the name of the query. It is one to one with the conformance statement for this query name, and it is in fact an identifier for that conformance statement

The CIR HL7 Web Service accepts query profiles Z34 and Z44; the expected values are “Z34^Request Immunization History^ CDCPHINVS” or “Z44^Request Immunization History and Forecast^ CDCPHINVS”.

If QPD-1 is not valued or contains a value other then expected values, the CIR HL7 Web Service will return a **fatal** error.

QPD-2 Query Tag (ST)

This is a required field; it must be valued by the HL7 Data Partner’s system to identify the query and may be used to match response messages to the originating query.

The CIR HL7 Web Service will echo it back in the RSP as the first field in the query acknowledgement segment (QAK).

QPD-3 Patient List (CX)

This field contains identifiers, such as the Medical Record Number (MR) or Local Registry ID (LR) that are intended to allow unique identification of the patient.

It is strongly recommended that the CIR's HL7 Data Exchange Partners include the following patient identifiers in their VXU messages because it will significantly decrease the time that it takes for the CIR HL7 Web Service to process and respond to the messages and increase the likelihood of a patient match:

- Local Registry ID (LR)
- Medical Record Number (MR)
- Medicaid Number (MA)
- Medicare Number (MC)

The Local Registry ID must be used to communicate the CIR's unique identifier (CIR ID) for the patient. When returning an RSP message in response to a QBP, the CIR HL7 Web Service will transmit the Local Registry ID back to the HL7 data exchange partner via the PID-3 field (identifier type "LR" for Local Registry ID). When returning an ACK message in response to a VXU message, the CIR HL7 Web Service will return the CIR ID in the MSH-10 field using the following format: "message identifier:CIR ID". The HL7 data exchange partner should store the Local Registry ID with their patient records and include that identifier in subsequent VXU and QBP messages.

If multiple identifiers of the same type are sent (e.g., multiple Medicaid Numbers), only the first identifier of that type (e.g., the first Medicaid Number) will be processed. Other identifiers of that same type will be ignored (not considered when seeking matching patients and no error reported).

The Medical Record Number is no longer required and may be left empty. However, if provided, the Medical Record Number must have at least 10 characters but cannot exceed 36. If sending a Medical Record Number, CIR HL7 Data Exchange Partners may value assigning authority (PID-3.

If the identifier exceeds the character limit or is formatted incorrectly, it will be reported as a non-fatal error and the identifier disregarded. If a patient identifier is included (PID-3.1) but the identifier type (PID-3.5) is missing, the number will be disregarded, and the missing type reported as a non-fatal error.

The Medicaid number must also be in the correct format, e.g., AA12345A; invalid formatting of the Medicaid number will also cause the Medicaid number to be disregarded (not considered when seeking matching patients) and reported as a non-fatal error.

If a patient identifier is included (QPD-3.1) but the identifier type value (QPD-3.5) is missing, the identifier will be disregarded and the missing type value reported as a non-fatal error.

If sending a Medical Record Number, CIR HL7 Data Exchange Partners should value assigning authority (QPD-3.4) with a Facility Code assigned by the NYC DOHMH. Other values are not supported and will be reported as a non-fatal error. No error is returned if QPD-3.4 is omitted. A patient identifier without a QPD-3.4 value will still be considered when seeking matching clients.

The CIR HL7 Web Service does not support the full data set of identifiers; for example, Birth Registry Number (BR) is currently not supported. Unsupported data will be labeled as a non-fatal error and will not be included in the search criteria. Social Security Number is **not** supported by the CIR HL7 Web Service. **Do not send Social Security Number**. See the Identifier Type Table 0203 in Appendix A of this document for values supported by the CIR database.

QPD-4 Patient Name (XPN)

This field contains the patient's legal name. **It is a required field** and does not repeat when included in a QPD message.

Since this field should represent the patient's primary/legal name, if a name type of "L" is not provided in QPD-4.7, the name will still be considered the legal name when searching for matching patients and no error will be reported.

Both the Patient Last/Family Name (QPD-4.1.1) and Patient First/Given Name (QPD-4.2) are required. If either field is not valued the CIR HL7 Web Service will return an RSP with an "AR" in QAK-2 (Query Response Status) indicating that there was an error that prohibited the search for a matching patient.

The Patient Middle Name (QPD-4.3) should be included, if available, but is not required.

The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise, it will be truncated and reported as a non-fatal error. Only the first 25 characters will be used when searching for a matching patient.

Other QPD-4 components, (e.g., Last Name Prefix, Suffix, Prefix, and Degree), are not required and, if provided, will be ignored, and not considered when searching for a matching patient.

QPD-5 Patient Mother Maiden Name (XPN)

This field contains the maiden name of the patient's mother.

If the name type (QPD-5.7) is omitted or other than "M" (Maiden Name), the name will still be considered the mother's maiden name when searching for matching patients and no error will be reported.

Only the Last/Family Name (QPD-5.1.1) is used when searching for matching patients.

Other QPD-5 components, (e.g., First/Given Name, Last Name Prefix, Suffix, Prefix, and Degree), are not required and, if provided, will be ignored, and not considered when searching for a matching patient.

QPD-6 Patient Date of Birth (TS_NZ)

This field contains the patient's date of birth. **It is a required field.**

The date must be in the YYYYMMDD format and must be on or before the current date; otherwise, it will be considered a fatal error. The time component of the data will be ignored if it is provided.

If QPD-6 does not contain a valid date the CIR HL7 Web Service will return an RSP with an "AE" in QAK-2 (Query Response Status) indicating that there was an error that prohibited the search for a matching patient.

QPD-7 Patient Sex (IS)

This field contains the patient's sex.

In a QBP message, CIR supports all the Administrative Sex codes specified in User-defined Table 001. The CIR will also accept the following codes and return the preferred single character codes:

User-defined Table 0001 – Administrative Sex

Preferred Value	Alternative Value	Description	Definition
F	F	Female	Person reports that she is female
M	M	Male	Person reports that he is male
U	U	Unknown	Unknown
D	UND	Undetermined / Undifferentiated	No assertion is made about the gender of the person
N	NFNM	Neither Female nor Male	Person reports as neither female nor male
P	PNTA	Prefer Not to Answer	Person prefers not to answer
O	OTH	Other	Person reports as other
A	NA	Not Asked	Person was not asked about administrative sex

QPD-8 Patient Address (XAD)

This field contains the patient's primary address.

If any QPD-8 component is valued then all the following components must be valued: Street Address (QPD-8.1.1), City (QPD-8.3), State (QPD-8.4), and Zip (QPD-8.5); otherwise, address will not be included in the patient search and a non-fatal Value Missing error will be reported for each omitted component.

QPD-8 should be valued as follows:

- Street or Mailing Address (QPD-8.1.1) should contain the house (dwelling) number in the beginning of the field followed by the street name. If the value exceeds 40 characters, it will be truncated.
    - If QPD-8.1.1 is valued, then QPD-8.1.2 (Street Name) and QPD-8.1.3 (Dwelling Number) should also be valued. QPD-8.1.2 and QPD-8.1.3 are optional; however, valuing these components (especially the House/Dwelling Number) will aid in patient searches.
- Other Designation (QPD-8.2) should contain the apartment or suite number, if applicable. The apartment number cannot exceed 10 characters, otherwise it will be truncated.
- City (QPD-8.3) cannot exceed 40 characters, otherwise it will be truncated.
- The State (QPD-8.4) cannot exceed 2 characters; otherwise, the state will be set to "NY".
- ZIP Code (QPD-8.5) cannot exceed 10 characters; otherwise, it will be ignored. The CIR HL7 Web Service supports the standard ZIP code formats of either ##### (5-digit ZIP only) or #####-#### (ZIP+4 including hyphen). If ZIP+4 is sent, the hyphen may be included but is not required.

    Example:
    |305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345^^P|

The CIR HL7 Web Service will process the first address; additional addresses, if sent, will be ignored.

Address Type (QPD-8.7) will be ignored, if sent. The address included in the query will be compared to all addresses on record for the patient.

Errors, (e.g., character maximum exceeded, invalid state code, ZIP less than 5 digits, missing component, etc.) will be reported as non-fatal.

QPD-9 Patient Home Phone (XTN)

This field contains the patient's cell phone number.

Example:
|**^PRN^CP^^^212^5551212**|

The CIR HL7 Web Service will process the first phone number. All other phone numbers will be ignored.

The CIR HL7 Web Service will process the 6th and 7th components (area code and local phone number) of the first phone number. If QPD-9 is valued then both the QPD-9.6 component (area code) and QPD-9.7 component (local phone number) must be valued; otherwise, the phone number will be disregarded, and a non-fatal error will be reported for the omitted component.

Telecommunication Use Code (QPD-9.2) will be ignored, if sent. The phone number included in the query will be compared to all phone numbers on record for the patient.

Telecom Equipment Type (QPD-9.3) will not be ignored, if sent. If 'CP' is included, cellphone provided in the query will be compared to all cellphone numbers on record for the patient.

If QPD-9.6 or QPD-9.7 contains errors, (e.g., area code is not 3 digits, phone number is not 7 digits, or area code is provided but the phone number is missing), those errors will be reported as non-fatal errors and the phone number will not be considered when searching for a matching patient.

QPD-10 Multiple Birth Indicator (ID)

This field indicates whether the patient was part of a multiple birth. If the status is undetermined, then field should be empty.

The acceptable values are Y (if the patient was part of a multiple birth) and N (if the patient was a single birth); all other values will be disregarded (not considered when searching for a matching patient) and reported as a non-fatal error.

QPD-11 Birth Order (NM)

For patients that were part of a multiple birth, this field indicates the birth order. If Multiple Birth Indicator (QPD-10) is populated with Y, then this field should contain the number indicating the person's birth order, with 1 for the first child born and 2 for the second.

Birth order is stored in the CIR database and utilized in a patient search. If the HL7 Data Exchange Partner knows the birth order, the birth order should be sent in QPD-11 of the QBP. QPD-11 will be ignored if it is not valued, or its value is not a number.

QPD-12 Client Last Updated Date (TS)

The CIR HL7 Web Service ignores this field.

QPD-13 Client Last Update Facility (HD)

The CIR HL7 Web Service ignores this field.

RCP – Response Control Parameter Segment

The RCP is a required segment; it is used to restrict the amount of data that should be returned in the RSP.

Table 5-3 Response Control Parameter (RCP) in a QBP

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Query Priority	ID	0091	[0..1]	[0..1]	O	O
2	Quantity Limited Request	CQ	0126	[0..1]	[0..1]	O	O
3	Response Modality	CE	0394	[0..1]	[0..1]	O	O
4	Execution and Delivery Time	TS		[0..1]	[0..1]	O	O
5	Modify Indicator	ID	0395	[0..1]	[0..1]	O	O
6	Sort-by Field	SRT		[0..1]	[0..1]	O	O
7	Segment group inclusion	ID		[0..*]	[0..1]	O	O

When a QPD is sent to the CIR HL7 Web Service, the response will be immediate and no more than one patient record will be included in the response. Expected field values are provided in the Field Usage Notes.

RCP Field Usage Notes

RCP-1 Query Priority (ID)

This field contains the time frame that the response is expected. The CIR HL7 Web Service will always respond immediately to a QPD request for immunization history and forecast. If RCP-1 is not valued or contains a value other than “I” (Immediate) the CIR HL7 Web Service will ignore the field and will process the message as if “I” was sent.

RCP-2 Quantity Limited Request (CQ)

This field contains the maximum length of the response that can be accepted by the HL7 Data Exchange Partner. A numerical value is given in the first component and the units are specified in the second component.

The CIR HL7 Web Service will never return more than one patient record in response to a QPD request for immunization history. If RCP-2 is not valued or contains a value other than “1” in RCP-2.1 and “RD” (records) in RCP-2.2 the CIR HL7 Web Service will ignore the field and will process the message as if “1^RD” was sent.

RCP-3 Response Modality (CE)

This field specifies the timing and grouping of the response message(s). HL7 Table 0394 – Response Modality contains values of “R” for Real Time and “B” for Batch. The CIR HL7 Web Service does not support batch processing; only real time messages are supported. If RCP-3 is not valued or contains a value other than “R” the CIR HL7 Web Service will ignore the field and will process the message as if “R” was sent.

DSC—Continuation Pointer Segment

If present, the entire DSC segment is ignored by the CIR HL7 Web Service.

6. Message Acknowledgement (ACK)

Overview

ACK in Response to a VXU Message

Regardless of whether the HL7 Data Exchange Partner sent a VXU message to delete an immunization, to report an immunization, or to do both, the submitSingleMessage operation will respond with an ACK.

If the VXU is processed successfully the submitSingleMessage operation sends an ACK response. MSA-1 will be valued with "AA" indicating that the VXU was successful and did not contain any errors.

If there are only non-fatal errors in the VXU message, the ACK will contain an MSA-1 value of "AE" as well as an ERR segment (one for each non-fatal error) that provides information about the error, such as the error location and the type of error.

When an ACK is sent in response to a successful VXU, the CIR ID of the relevant patient record is included in the response. The MSH-10 field, along with the unique message identifier (control id) assigned by the CIR HL7 Web Service, contains the CIR ID, in the format of the message identifier first, then a colon, and then the CIR ID. For example: "20120724111525-0400CIR-WS:43666424" where "20120724111525-0400CIR-WS" is the message identifier and "43666424" is the patient's CIR ID. The HL7 data exchange partner system should store that CIR ID with the patient record and include that CIR ID (i.e., Local Registry ID) in future VXU and QBP messages to decrease the time that it takes for the web service to process the messages and respond. Under certain circumstances, a patient's CIR ID may change. The CIR HL7 Web Service will always send the most current CIR ID in the ACK response message; therefore, the CIR ID returned by the CIR HL7 Web Service within the ACK may be different from the CIR ID that the HL7 Data Exchange Partner submitted in the VXU message. The HL7 Data Exchange Partner's system should replace its existing CIR ID reference with the new CIR ID that was communicated within the ACK message.

If a fatal error occurs during processing, the submitSingleMessage operation sends an ACK response with a MSA-1 value of "AR" indicating the VXU message was rejected due to fatal errors. The ACK will contain an ERR segment (one for each fatal error) that provides information about the error, such as the error location and the type of error.

ACK in Response to a QBP Message

The CIR HL7 Web Service supports querying the CIR for a patient's immunization history and immunization recommendations (via the submitSingleMessage operation) using the Z34 profile or Z44 profiles, respectively, for QBP messages. If the QBP message is malformed and, therefore, cannot be parsed, the CIR HL7 Web Service will return an ACK response message.

When the CIR HL7 Web Service returns an HL7 formatted ACK message in response to a QBP message that cannot be parsed:

- The CIR HL7 Web Service will return a value of "AR" in MSA-1 (Acknowledgement Code).

When the CIR HL7 Web Service returns an HL7 formatted RSP message in response to a QBP messages that can be parsed and has fatal errors:

- The CIR HL7 Web Service will return a value or "AE" in MSA-1 (Acknowledgement Code).
- The details of the fatal errors, as well as any non-fatal errors, will be reported in the ERR segment(s).

ACK Message Segments

MSH—Message Header Segment

Table 6-1 Message Header Segment (MSH) in an ACK

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Field Separator	ST		[1..1]	[1..1]	R	R
2	Encoding Characters	ST		[1..1]	[1..1]	R	R
3	Sending Application	HD	0361	[0..1]	[1..1]	RE	R
4	Sending Facility	HD	0362	[0..1]	[1..1]	RE	R
5	Receiving Application	HD	0361	[0..1]	[1..1]	RE	R
6	Receiving Facility	HD	0362	[0..1]	[1..1]	RE	R
7	Date/Time Of Message	TS_Z		[1..1]	[1..1]	R	R
8	Security	ST		[0..1]	[0..1]	O	O
9	Message Type	MSG		[1..1]	[1..1]	R	R
10	Message Control ID	ST		[1..1]	[1..1]	R	R
11	Processing ID	PT		[1..1]	[1..1]	R	R
12	Version ID	VID		[1..1]	[1..1]	R	R
13	Sequence Number	NM		[0..1]	[0..1]	O	O
14	Continuation Pointer	ST		[0..1]	[0..1]	O	O
15	Accept Acknowledgement Type	ID	0155	[0..1]	[0..1]	RE	R
16	Application Acknowledgment Type	ID	0155	[0..1]	[0..1]	RE	R
17	Country Code	ID	0399	[0..1]	[0..1]	O	O
18	Character Set	ID	0211	[0..1]	[0..1]	O	O
19	Principal Language Of Message	CE		[0..1]	[0..1]	O	O
20	Alternate Character Set Handling Scheme	ID	0356	[0..1]	[0..1]	O	O
21	Message Profile Identifier	EI		[0..*]	[0..0]	O	RE

MSH Field Usage Notes

MSH-1 Field Separator (ST)

The CIR HL7 Web Service will value this field with "|".

Example:
MSH|
↑

MSH-2 Encoding Characters (ST)

The CIR HL7 Web Service will value this field with "^~\&" (ASCII 94, 126, 92, and 38, respectively).

MSH-3 Sending Application (HD)

The CIR HL7 Web Service will value this field with "CIR HL7 Web Service x.xx", where x.xx represents the current version number.

MSH-4 Sending Facility (HD)

The CIR HL7 Web Service will value this field with “NYC DOHMH”.

MSH-5 Receiving Application (HD)

The CIR HL7 Web Service will value this field with what was provided in MSH-3.1 of the corresponding QBP or VXU message.

MSH-6 Receiving Facility (HD)

The CIR HL7 Web Service will value this field with what was provided in MSH-4.1 of the corresponding QBP or VXU message.

MSH-7 Date/Time of Message (TS_Z)

This field contains the date/time that the sending system created the message. The CIR HL7 Web Service will value this field using the format of YYYYMMDDHHMMSS-ZZZZ.

Example:
|20120204030159-0500|
This represents February 4, 2012, at 3:01:59 Eastern Standard Time (EST).

Example:
|20120710061152-0400|
This represents July 10, 2012, at 06:11:52 Eastern Daylight Savings Time (EDT).

> The time zone was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

MSH-9 Message Type (MSG)

The CIR HL7 Web Service will value this field with “ACK^V04^ACK”.

> The third component, message structure ID (MSH-9.3) was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

MSH-10 Message Control ID (ST)

This field contains the message identifier assigned by the CIR HL7 Web Service, e.g., “20230616000440-0400-81a20d4cc3d3421cb522a583b356b0f2-CIR-WS:918014089”.

The first part of the message will be a date/time stamp for the date and time the ACK was sent and include a time zone identifier.

When returning an ACK in response to a VXU, the assigned message ID by the CIR for the corresponding VXU will be included after the date/time/time zone. The message ID will be a set of alphanumeric characters. An example message ID: 81a20d4cc3d3421cb522a583b356b0f2

When returning an ACK in response to a successful VXU, the CIR HL7 Web Service will also return the patient’s CIR ID. The format will be after the date/time/timestamp and then the CIR ID, e.g., “CIR-WS:43666424”.

MSH-11 Processing ID (PT)

The CIR HL7 Web Service will value this field with “P” for Production messages and “T” for Test messages.

MSH-12 Version ID (VID)

When sending a 2.5.1 message, the CIR HL7 Web Service will value this field with “2.5.1”.

MSH-15 Accept Acknowledgment Type (ID)

This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message.

Since the CIR HL7 Web Service does not expect nor require the HL7 Data Exchange Partner to send an acknowledgment in response to an ACK message, the CIR HL7 Web Service will value this field with “NE” (Never).

MSH-16 Application Acknowledgment Type (ID)

This field contains the conditions under which application acknowledgments are required to be returned in response to this message.

Since the CIR HL7 Web Service does not expect nor require the HL7 Data Exchange Partner to send an acknowledgment in response to an ACK message, the CIR HL7 Web Service will value this field with “NE” (Never).

MSH-21 Message Profile Identifier (EI)

This field is used to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.

The CIR HL7 Web Service will not value this field when returning an ACK in response to a VXU or RSP message.

SFT—Software Segment

The SFT segment will not be included in an ACK message.

MSA—Message Acknowledgement Segment

Table 6-2 Message Acknowledgement Segment (MSA) in an ACK

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Acknowledgment Code	ID	0008	[1..1]	[1..1]	R	R
2	Message Control ID	ST		[1..1]	[1..1]	R	R
3	Text Message	ST		[0..1]	[0..1]	O	O
4	Expected Sequence Number	NM		[0..1]	[0..1]	O	O
5	Delayed Acknowledgment Type			[0..1]	[0..1]	O	O
6	Error Condition	CE	0357	[0..0]	[0..0]	X	X

MSA Field Usage Notes

MSA-1 Acknowledgment Code (ID)

The CIR HL7 Web Service will value this field with one of the following acknowledgement codes from HL7 Table 0008:

Code	Description	Condition
AA	Application Acknowledgement: Accept	MSA-1 will be populated with “AA” when an ACK is returned in response to VXU that was successful and contained no errors.
AE	Application Acknowledgement: Error	MSA-1 will be populated with “AE” when an ACK is returned in response to VXU that was successful but contained non-fatal errors. Each non-fatal error will be reported in an ERR segment.
AR	Application Acknowledgement: Reject	MSA-1 will be populated with “AR” when an ACK is returned in response to VXU that was rejected (i.e., contained fatal errors). Each fatal error will be reported in an ERR segment. MSA-1 will be populated with “AR” when an ACK is returned in response to a QBP that could not be parsed. We differ from the CDC IG such that the CIR does not value MSA-1 with “AE” for fatal errors and does not limit “AR” value for MSH field errors.

MSA-2 Message Control ID (ST)

The CIR HL7 Web Service will value this field with the message control ID of the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended. This field echoes the message control id sent in MSH-10 by the initiating system.

ERR—Error Segment

Table 6-3 Error Segment (ERR) in an ACK

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Error Code and Location	ELD		[0..0]	[0..0]	X	X
2	Error Location	ERL		[0..1]	[0..1]	RE	RE
3	HL7 Error Code	CWE	0357	[1..1]	[1..1]	R	R
4	Severity	ID	0516	[1..1]	[1..1]	R	R
5	Application Error Code	CWE	0533	[0..1]	[0..1]	O	RE
6	Application Error Parameter	ST		[0..1]	[0..1]	O	O
7	Diagnostic Information	TX		[0..1]	[0..1]	O	O
8	User Message	TX		[0..1]	[0..1]	O	R
9	Inform Person Indicator	IS	0517	[0..1]	[0..1]	O	O
10	Override Type	CWE	0518	[0..1]	[0..1]	O	O
11	Override Reason Code	CWE	0519	[0..1]	[0..1]	O	O
12	Help Desk Contact Point	XTN		[0..1]	[0..1]	O	O

ERR Field Usage Notes

ERR-2 Error Location (ERL)

The CIR HL7 Web Service will value this field with the location of the error within the VXU or QBP message. Each error will have an ERR, so no repeats are allowed on this field. This field will only be empty if location is not meaningful (e.g., unidentifiable).

ERR-2 will be formatted as follows:

- The 1st component contains the Segment ID
- The 2nd component contains the Segment Sequence
- The 3rd component contains the Field Position
- The 4th component contains the Field Repetition
- The 5th component contains the Component Number

Example for ERR-2 if there were no RXA segments sent in a VXU message (i.e., RXA was missing):

ERR||**RXA^1**|

Example for ERR-2 if RXA-5 (Administered Code) was not valued in the second RXA of the VXU message:

ERR||**RXA^2^5^1**|

*If PID-3 was valued with "*CC88888C^^^^MA~123456789^^^^~A123456789^^^^MC", *then ERR-2 would be valued as follows to indicate the error is in the 2nd repetition of PID-3.5 of the 1st (only) PID segment:*

ERR||**PID^1^3^2^5**|

ERR-3 HL7 Error Code (CWE)

The CIR HL7 Web Service will value this field the HL7 (communications) error code. Code examples include:

Code	Text	Description
100	Segment sequence error	The message segments were not in the proper order.
101	Required field missing	A required field is missing from the segment.
102	Data type error	The field contained data of the wrong data type, e.g., a NM (number) field contained letters.
103	Table value not found	A field of data type ID or IS was compared against the corresponding table and no match was found.
200	Unsupported message type	The message type is not supported.
203	Unsupported version ID	The Version ID is not supported.
204	Unknown key identifier	The identifier was not found.

Refer to HL7 Table 0357 – Message Error Condition Codes within the CDC IG for all valid values.

Example: ERR||PID^1^7^1**|102^data type error^HL70357|**

ERR-4 Severity (ID)

The CIR HL7 Web Service will value this field with one of the following HL7 Error Severity codes (from HL7 Table 0516):

- “W” (Warning) if the error was non-fatal; non-fatal errors may result in loss of data.
- “E” (Error) if the error was fatal.

ERR-5 Application Error Code (CWE)

If meaningful to help identify the specific error that occurred, the CIR HL7 Web Service will value this field with one of the application specific error codes from User-Defined Table 0533 (see Appendix A).

Example:
ERR||PID^1^7^1|102^data type error^HL70357|E**|BadDateTime^^HL70533|**

ERR-8 User Message (TX)

To provide a human-readable description of the error, the CIR HL7 Web Service will value this field with the name of the segment and field containing the error followed by a short description of the error.

Example:
ERR||PID^1^7^1|102^ data type error^
HL70357|E|BadDateTime^^HL70533|||**PID_Patient_DOB: BadDateTime**|

ERR-8 will contain a value of “Improperly Formatted Message” if the submitted message could not be parsed. If HL7 Data Exchange Partners receive this user message they should verify that the submitted message is formatted correctly (e.g., proper MSH-1 and MSH-2 values) and that the message type

(MSH-9) contains the proper values for the type of message being submitted (i.e., “VXU^V04^VXU_V04” for VXU messages and “QBP^Q11^QBP_Q11” for QBP messages).

7. Query Response (RSP)

Overview

The CIR HL7 Web Service supports querying the CIR for a patient's immunization history and immunization recommendations using the Z34 or Z44 profiles for QBP messages. If the QBP message is properly formatted (and, therefore, can be parsed), the CIR HL7 Web Service will return an RSP response message using the Z32, Z42 or Z33 profile. The CIR HL7 Web Service will always return both a patient's immunization history and recommendations for both Z34 and Z44 profile requests.

For QBP messages using the Z34 Profile:

- Single Matching Patient
    - If the CIR HL7 Web Service locates exactly one matching patient, the interface will return an HL7 formatted RSP message that contains the CIR's patient ID, the patient's immunization history (including an indicator of any immunizations that are determined to be invalid), and the recommended vaccinations (including due date).
        - If there were no errors in the QBP message:
            - MSH-21 will be valued with Z32^CDCPHINVS
            - QAK-2 (Query Response Status) will contain a value of "OK" indicating that the patient was found and there were no errors
            - MSA-1 (Acknowledgement Code) will be valued with "AA"
            - QPD-1 will be valued with the QPD-1 sent in the QBP message (e.g., Z34^Request Immunization History^CDCPHINVS).
        - If there were non-fatal errors in the QBP message:
            - MSH-21 will be valued with Z32^CDCPHINVS
            - QAK-2) will contain a value of "OK" indicating that the patient was found and MSA-1 will be valued with "AE"
            - The non-fatal errors will be reported in the ERR segments; ERR-4 (Error Severity) will be valued with "W" for "Warning".
            - QPD-1 will be valued with the QPD-1 sent in the QBP message (e.g., Z34^Request Immunization History^CDCPHINVS).
- No Patients Found
    - If the CIR HL7 Web Service cannot locate any matching patients, the interface will return an HL7 formatted RSP message that includes the following:
        - If there were no errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS
            - QAK-2 will contain a value of "NF" indicating no matching patients were found.
            - MSA-1 (Acknowledgement Code) will be valued with "AA"
        - If there were non-fatal errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS
            - QAK-2 will contain a value of "NF" indicating no matching patients were found.
            - MSA-1 (Acknowledgement Code) will be valued with "AE"
            - The non-fatal errors will be reported in the ERR segments; ERR-4 (Error Severity) will be valued with "W" for "Warning".
- More Than One Patient Found
    - If the CIR HL7 Web Service locates multiple matching patients, the interface will return an HL7 formatted RSP message that includes the following:
        - If there were no errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS

                - QAK-2 will contain a value of “TM” indicating multiple matches were found.
                - MSA-1 (Acknowledgement Code) will be valued with “AA”
            - If there were non-fatal errors in the QBP message:
                - MSH-21 will be valued with Z33^CDCPHINVS
                - QAK-2 will contain a value of “TM” indicating multiple matches were found.
                - MSA-1 will be valued with “AE”
                - The non-fatal errors will be reported in the ERR segments; ERR-4 (Error Severity) will be valued with “W” for “Warning”.
- Fatal Errors (but message can still be parsed)
    - If the query is malformed (e.g., a required field is missing in a required segment), the interface will return an HL7 formatted RSP message without any patient information.
        - MSH-21 will be valued with Z23^CDCPHINVS
        - QAK-2 will contain a value of “AE” indicating no matching patients were found.
        - MSA-1 will contain a value of “AE”.
        - The fatal errors, as well as any non-fatal errors, will be reported in the ERR segments. Fatal errors will have an ERR-4 (Error Severity) value of “E” for “Error” while non-fatal errors will have an ERR-4 value of “W” for “Warning”.

For QBP messages using the Z44 Profile:

- Single Matching Patient
    - If the CIR HL7 Web Service locates exactly one matching patient, the interface will return an HL7 formatted RSP message that contains the CIR’s patient ID, the patient’s immunization history (including an indicator of any immunizations that are determined to be invalid), and the recommended vaccinations (including due date).
        - If there were no errors in the QBP message:
            - MSH-21 will be valued with Z42^CDCPHINVS
            - QAK-2 (Query Response Status) will contain a value of “OK” indicating that the patient was found.
            - MSA-1 (Acknowledgement Code) will be valued with “AA” indicating that there were no errors.
            - QPD-1 will be valued with the QPD-1 sent in the QBP message (e.g., Z44^Request Immunization History^CDCPHINVS).
        - If there were non-fatal errors in the QBP message:
            - MSH-21 will be valued with Z42^CDCPHINVS
            - QAK-2 (Query Response Status) will contain a value of “OK” indicating that the patient was found.
            - MSA-1 will be valued with “AE”
            - The non-fatal errors will be reported in the ERR segments; ERR-4 (Error Severity) will be valued with “W” for “Warning”.
            - QPD-1 will be valued with the QPD-1 sent in the QBP message (e.g., Z44^Request Immunization History^CDCPHINVS).
- No Patients Found
    - If the CIR HL7 Web Service cannot locate any matching patients, the interface will return an HL7 formatted RSP message that includes the following:
        - If there were no errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS
            - QAK-2 will contain a value of “NF” indicating no matching patients were found.

            - MSA-1 (Acknowledgement Code) will be valued with “AA”
        - If there were non-fatal errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS
            - QAK-2 will contain a value of “NF” indicating no matching patients were found.
            - MSA-1 will be valued with “AE”
            - The non-fatal errors will be reported in the ERR segments; ERR-4 (Error Severity) will be valued with “W” for “Warning”.
- More Than One Patient Found
    - If the CIR HL7 Web Service locates multiple matching patients, the interface will return an HL7 formatted RSP message that includes the following:
        - If there were no errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS
            - QAK-2 will contain a value of “TM” indicating multiple matches were found.
            - MSA-1 (Acknowledgement Code) will be valued with “AA”
        - If there were non-fatal errors in the QBP message:
            - MSH-21 will be valued with Z33^CDCPHINVS
            - QAK-2 will contain a value of “TM” indicating multiple matches were found.
            - MSA-1 will be valued with “AE”
            - The non-fatal errors will be reported in the ERR segments; ERR-4 (Error Severity) will be valued with “W” for “Warning”.
- Fatal Errors (but message can still be parsed)
    - If the query is malformed (e.g., a required field is missing in a required segment), the interface will return an HL7 formatted RSP message without any patient information.
        - MSH-21 will be valued with Z23^CDCPHINVS
        - QAK-2 will contain a value of “AE” indicating no matching patients were found.
        - MSA-1 will contain a value of “AE”.
        - The fatal errors, as well as any non-fatal errors, will be reported in the ERR segments. Fatal errors will have an ERR-4 (Error Severity) value of “E” for “Error” while non-fatal errors will have an ERR-4 value of “W” for “Warning”.

When a single matching patient is found, the RSP message’s Response Group segments will contain the following:

- Patient Data
    - CIR ID
    - Patient Name (First, Middle, and Last)
    - Date of Birth
    - Sex
    - Address
    - Home phone and cell phone number, and email address
- Immunization History
    - If a patient has immunization history, the RSP will include an ORC/RXA segment combination for each immunization.
        - The RXA segment will include the administration date, vaccine code, and vaccine description and completion code.
        - If available, the RXA segment will also include the administered location, amount and unit, lot number, expiration date, and manufacturer associated with the immunization.
        - Each RXA segment will be followed by one or more OBX segments that identify the vaccine

component(s).

- If an immunization is a multi-component vaccine, an OBX will be included for each component.
- If the immunization is not a multi-component vaccine only one OBX segment identifying the vaccine component will follow the RXA segment.

▪ In addition, for the 18 vaccine groups that the CIR evaluates, if any immunization component is considered **not** valid (based on the ACIP schedule) the vaccine component OBX segment will be followed by three additional OBX segments.

- The first additional OBX segment will indicate that the component was not valid.
- The next OBX segment will give the reason the component is invalid.
- The final OBX segment indicates that the ACIP schedule was used to determine that the vaccine component was not valid

o If a patient does not have an immunization history, the RSP will contain an RXA segment stating, "no vaccine administered".

Example:

RXA|0|1|20121212|20121212|**998^no vaccine administered^CVX**|999|

- Immunization Recommendations
  - o Recommendation data, for the 18 vaccine groups that the CIR evaluates, will display at the end of the RSP following the immunization history.
    - ▪ There will be an ORC/RXA segment pair for each vaccine group. The ORC segment will provide the name of the vaccine group and the RXA segment will state "no vaccine administered".

      Example:

      ORC|RE||**MMR**^NYC-CIR|

      RXA|0|1|||**998^No vaccine administered^CVX**|999|
    - ▪ The recommendation data for that vaccine group will display in multiple OBX segments following the OBX/RXA pair.
      - For recommended vaccines, these OBX segments will contain, along with other data, the recommended vaccine code and the date the next dose is recommended.
      - For vaccines not recommended or conditionally recommended, an OBX will indicate the vaccine group and the reason, based on the ACIP schedule.

RSP Message Segments

MSH—Message Header Segment

Table 7-1 Message Header Segment (MSH) in an RSP

SEQ	Element Name	Data Type	Value set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Field Separator	ST		[1..1]	[1..1]	R	R
2	Encoding Characters	ST		[1..1]	[1..1]	R	R
3	Sending Application	HD	0361	[0..1]	[1..1]	RE	R
4	Sending Facility	HD	0362	[0..1]	[1..1]	RE	R
5	Receiving Application	HD	0361	[0..1]	[1..1]	RE	R
6	Receiving Facility	HD	0362	[0..1]	[1..1]	RE	R
7	Date/Time Of Message	TS_Z		[1..1]	[1..1]	R	R
8	Security	ST		[0..1]	[0..1]	O	O
9	Message Type	MSG		[1..1]	[1..1]	R	R
10	Message Control ID	ST		[1..1]	[1..1]	R	R
11	Processing ID	PT		[1..1]	[1..1]	R	R
12	Version ID	VID		[1..1]	[1..1]	R	R
13	Sequence Number	NM		[0..1]	[0..1]	O	O
14	Continuation Pointer	ST		[0..1]	[0..1]	O	O
15	Accept Acknowledgement Type	ID	0155	[0..1]	[0..1]	RE	R
16	Application Acknowledgment Type	ID	0155	[0..1]	[0..1]	RE	R
17	Country Code	ID	0399	[0..1]	[0..1]	O	O
18	Character Set	ID	0211	[0..1]	[0..1]	O	O
19	Principal Language Of Message	CE		[0..1]	[0..1]	O	O
20	Alternate Character Set Handling Scheme	ID	0356	[0..1]	[0..1]	O	O
21	Message Profile Identifier	EI		[0..*]	[1..1]	O	R

MSH Field Usage Notes

MSH-1 Field Separator (ST)

The CIR HL7 Web Service will value this field with "|".

Example:
MSH|
↑

MSH-2 Encoding Characters (ST)

The CIR HL7 Web Service will value this field with "**^~\&**" (ASCII 94, 126, 92, and 38, respectively).

MSH-3 Sending Application (HD)

The CIR HL7 Web Service will value this field with "CIR HL7 WS x.xx", where x.xx represents the current version number.

MSH-4 Sending Facility (HD)

The CIR HL7 Web Service will value this field with “NYC DOHMH”.

MSH-5 Receiving Application (HD)

The CIR HL7 Web Service will value this field with what was provided in MSH-3.1 of the corresponding QBP message.

MSH-6 Receiving Facility (HD)

The CIR HL7 Web Service will value this field with what was provided in MSH-4.1 of the corresponding QBP message.

MSH-7 Date/Time of Message (TS_Z)

This field contains the date/time that the sending system created the message. The CIR HL7 Web Service will value this field using the format of YYYYMMDDHHMMSS-ZZZZ.

Example:
|20120204030159-0500|
This represents February 4, 2012, at 3:01:59 Eastern Standard Time (EST).

Example:
|20120710061152-0400|
This represents July 10, 2012, at 06:11:52 Eastern Daylight Savings Time (EDT).

The time zone was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

MSH-9 Message Type (MSG)

The CIR HL7 Web Service will value this field with “RSP^K11^RSP_K11”.

The third component, message structure ID (MSH-9.3) was not required in version 2.3.1; however, it is required by the CDC IG for 2.5.1.

MSH-10 Message Control ID (ST)

This field contains the message identifier assigned by the CIR HL7 Web Service, e.g., “20120724111525-0400CIR-WS”.

When returning an RSP in response to a successful QBP, the CIR HL7 Web Service will also return the patient's CIR ID. The format will be the message identifier followed by a colon and then the CIR ID, e.g., "20120724111525-0400CIR-WS:43666424”.

MSH-11 Processing ID (PT)

The CIR HL7 Web Service will value this field with “P” for Production messages and “T” for Test messages.

MSH-12 Version ID (VID)

When sending a 2.5.1 message, the CIR HL7 Web Service will value this field with “2.5.1”.

MSH-15 Accept Acknowledgment Type (ID)

This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message.

Since the CIR HL7 Web Service does not expect nor required the HL7 Data Exchange Partner to send an acknowledgment in response to the RSP message, the CIR HL7 Web Service will value this field with “NE” (Never).

MSH-16 Application Acknowledgment Type (ID)

This field contains the conditions under which application acknowledgments are required to be returned in response to this message.

Since the CIR HL7 Web Service does not expect nor required the HL7 Data Exchange Partner to send an acknowledgment in response to the RSP message, the CIR HL7 Web Service will value this field with “NE” (Never).

MSH-21 Message Profile Identifier (EI)

This field is used to assert adherence to, or reference, a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.

If a QBP message using the Z44 profile is received, the CIR HL7 Web Service will value this field with Z42^CDCPHINVS when returning an RSP where a single matching patient was found.

If a QBP message using the Z34 profile is received, the CIR HL7 Web Service will value this field with Z32^CDCPHINVS when returning an RSP where a single matching patient was found.

This field will be valued Z33^CDCPHINVS when returning an RSP where no matches or too many matches were found.

MSA—Message Acknowledgement Segment

Table 7-2 Message Acknowledgement Segment (MSA) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	*CIR HL7 Web Service* Usage
1	Acknowledgment Code	ID	0008	[1..1]	[1..1]	R	R
2	Message Control ID	ST		[1..1]	[1..1]	R	R
3	Text Message	ST		[0..1]	[0..1]	O	O
4	Expected Sequence Number	NM		[0..1]	[0..1]	O	O
5	Delayed Acknowledgment Type			[0..1]	[0..1]	O	O
6	Error Condition	CE	0357	[0..0]	[0..0]	X	X

MSA Field Notes

MSA-1 Acknowledgement Code (ID)

This field contains an acknowledgment code. When responding with an RSP, the CIR HL7 Web Service will value the MSA-1 field as follows:

Code	Description	Condition
AA	Application Acknowledgement: Accept	“AA” if the QBP can be identified (parsed) as a query and contains no errors.
AE	Application Acknowledgement: Error	“AE” if the QBP can be identified (parsed) as a query and contains non-fatal errors.
AE	Application Acknowledgement: Reject	“AE” if the QBP can be identified (parsed) as a query but contains fatal errors.

MSA-2 Message Control ID (ST)

The CIR HL7 Web Service will value this field with the Message Control ID sent by the HL7 Data Exchange partner in MSH-10 of the QBP.

ERR—Error Segment

Table 7-3 Error Segment (ERR) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Error Code and Location	ELD		[0..0]	[0..0]	X	X
2	Error Location	ERL		[0..1]	[0..1]	RE	RE
3	HL7 Error Code	CWE	0357	[1..1]	[1..1]	R	R
4	Severity	ID	0516	[1..1]	[1..1]	R	R
5	Application Error Code	CWE	0533	[0..1]	[0..1]	O	RE
6	Application Error Parameter	ST		[0..1]	[0..1]	O	O
7	Diagnostic Information	TX		[0..1]	[0..1]	O	O
8	User Message	TX		[0..1]	[0..1]	O	R
9	Inform Person Indicator	IS	0517	[0..1]	[0..1]	O	O
10	Override Type	CWE	0518	[0..1]	[0..1]	O	O
11	Override Reason Code	CWE	0519	[0..1]	[0..1]	O	O
12	Help Desk Contact Point	XTN		[0..1]	[0..1]	O	O

ERR Field Usage Notes

ERR-2 Error Location (ERL)

The CIR HL7 Web Service will value this field with the location of the error within the QBP message. Each error will have an ERR, so no repeats are allowed on this field. This field will only be empty if location is not meaningful (e.g., unidentifiable).

ERR-2 will be formatted as follows:

- The 1st component contains the Segment ID
- The 2nd component contains the Segment Sequence
- The 3rd component contains the Field Position
- The 4th component contains the Field Repetition
- The 5th component contains the Component Number

Example for ERR-2 if the entire QPD segment was missing:
ERR||**QPD^1**|

Example for ERR-2 if QPD-4 (Patient Name) was not valued:
ERR||**QPD^1^4^1**|

*If QPD-3 was valued with "*CC88888C^^^^MA~123456789^^^^~A123456789^^^^MC", *then ERR-2 would be valued as follows to indicate the error is in the 2nd repetition of QPD-3.5 of the 1st (only) QPD segment:*
ERR||**QPD^1^3^2^5**|

ERR-3 HL7 Error Code (CWE)

The CIR HL7 Web Service will value this field the HL7 (communications) error code. Code examples include:

Code	Text	Description
100	Segment sequence error	The message segments were not in the proper order or required segments are missing.
101	Required field missing	A required field is missing from the segment.
102	Data type error	The field contained data of the wrong data type, e.g., a NM (number) field contained letters of the alphabet.
103	Table value not found	A field of data type ID or IS was compared against the corresponding table and no match was found.
200	Unsupported message type	The message type is not supported.
203	Unsupported version ID	The Version ID is not supported.

Refer to HL7 Table 0357 – Message Error Condition Codes within the CDC IG for all valid values.

Example:
ERR||QPD^1^6^1**|102^data type error^HL70357|**

ERR-4 Severity (ID)

The CIR HL7 Web Service will value this field with one of the following HL7 Error Severity codes (from HL7 Table 0516):

- “W” (Warning) if the error was non-fatal; non-fatal errors may result in loss of data.
- “E” (Error) if the error was fatal.

ERR-5 Application Error Code (CWE)

If meaningful to help identify the specific error that occurred, the CIR HL7 Web Service will value this field with one of the application specific error codes from User-Defined Table 0533 (see Appendix A).

Example:
ERR||QPD^1^6^1|102^data type error^HL70357|E**|BadDateTime^^HL70533|**

ERR-8 User Message (TX)

To provide a human-readable description of the error, the CIR HL7 Web Service will value this field with the name of the segment and field containing the error followed by a short description of the error.

Example:
ERR||QPD^1^6^1|102^ data type error^
HL70357|E|BadDateTime^^HL70533|||**QPD_Patient_DOB: BadDateTime**|

QAK—Query Acknowledgement Segment

Table 7-4 Query Acknowledgement Segment (QAK) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Query Tag	ST		[1..1]	[1..1]	R	R
2	Query Response Status	ID	0208	[0..1]	[1..1]	O	R
3	Message Query Name	CE	0471	[0..1]	[0..1]	O	O
4	Hit Count	NM		[0..1]	[0..1]	O	O
5	This payload	NM		[0..1]	[0..1]	O	O
6	Hits remaining	NM		[0..1]	[0..1]	O	O

QAK Field Usage Notes

QAK-1 Query Tag (ST)

The CIR HL7 Web Service will value this field with the value sent by the HL7 Data Exchange Partner in QPD-2 (query tag) of the corresponding QBP message.

QAK-2 Query Response Status (ID)

The CIR HL7 Web Service will value this field with one of the following HL7 Query Response Status codes (from HL7 Table 0208):

- “OK” if there were no errors in the QBP and a single matching patient was found.
- “NF” if there were no errors in the QBP and a matching patient was not found.
- “TM” if there were no errors in the QBP and more than one matching patient was found.

QAK-3 Message Query Name (CE)

The CIR HL7 Web Service will value this field with the value set by the HL7 Data Exchange Partner in QPD-1 of the corresponding QBP message.

QPD – Query Parameter Definition Segment

The Response QPD segment echoes back the information exactly as it was received in the QPD segment of the QBP request sent by the HL7 Data Exchange Partner.

PID – Patient Identifier Segment

The PID segment is part of the Response Group. **The Response Group (which includes the PID, ORC, RXA, and OBX segments) will only be returned when a single matching patient is found.**

The CIR HL7 Web Service returns only one PID segment per RSP.

Patient demographic data returned in an RSP is limited by the CIR to the patient’s name, date of birth, administrative sex, address, home phone and cell phone; additional information is not allowed to be returned. Therefore, the CIR HL7 Web Service only supports and returns the PID fields listed below. All other PID fields

are not supported (cardinality of [0..0] and usage of “X”). Non-supported fields have been omitted from the table below.

Table 7-5 Patient Identifier Segment (PID) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Cardinality
1	Set ID - PID	SI		[0..1]	[0..1]	RE	R
3	Patient Identifier List	CX		[1..*]	[1..*]	R	R
5	Patient Name	XPN		[1..*]	[1..1]	R	R
7	Date/Time of Birth	TS		[1..1]	[1..1]	R	R
8	Administrative Sex	IS	0001	[0..1]	[1..1]	RE	R
11	Patient Address	XAD		[0..*]	[0..1]	RE	RE
13	Patient Phone Number	XTN		0..*]	0..*]	O	RE

Non-supported fields (usage of “X” and NOT listed in the table above) will not be valued by the CIR HL7 Web Service. All other fields are described in the Field Usage Notes that follow.

PID Field Usage Notes

PID-1 Set ID - PID (SI)

This field contains the number that identifies this transaction. For an RSP, this should always be 1.

PID-3 Patient Identifier List (CX)

The CIR HL7 Web Service will value PID-3.1 with the patient’s CIR ID, i.e., the local registry ID (LR), and PID-3.2 with the patient’s Medical Record Number (MR) only if the organization responsible is querying.

A single VXU message may contain multiple MRNs for the same patient. The CIR HL7 Web Service returns the MRN associated with the sending responsible organization in MSH-22 or MSH-4.2. If MSH-22 and MSH-4.2 are not populated, no Medical Record Number is returned.

The CIR HL7 Web Service will also return Assigning Authority (PID-3.4) for each patient identifier returned. For a Local Registry ID, the CIR HL7 Web Service will return a PID-3.4 value of “BAA’, the grantee code for New York City. For a Medical Record Number, the CIR HL7 Web Service will return the associated Facility ID assigned by NYC DOHMH.

> The HL7 data exchange partner should store the Local Registry ID with their patient record and include that identifier in subsequent VXU and QBP messages to decrease the time it takes for the CIR HL7 Web Service to process the message and respond.

PID-5 Patient Name (XPN)

The CIR HL7 Web Service will value this field with the patient’s legal (L) name (first, middle, and last).

PID-7 Date/Time of Birth (TS_NZ)

The CIR HL7 Web Service will value this field with the patient’s date and time of birth in the YYYYMMDD format.

PID-8 Administrative Sex (IS)

The CIR HL7 Web Service will value this field with the patient's sex (M for Male or F for Female).

When searching for a matching patient, only QPD-8, Administrative Sex Values of 'F' and 'M' will be considered.

See the User-defined Table 0001 - Sex in Appendix A of this document for values supported by the CIR database.

PID-11 Patient Address (XAD)

The CIR HL7 Web Service will value this field with the current address of the patient. If no current address is selected, the CIR HL7 Web Service will value the field with the most recently added address of the patient. If no address is associated with the patient, this field will be left blank.

PID-13 Patient Phone Number (XTN)

Definition: This field contains the patient's personal phone numbers. Each type of telecommunication shall be in its' own repetition. For example, if a person has a phone number and an email address, they shall each have a repetition.

PD1 – Patient Demographic Segment

The CIR HL7 Web Service will not include a Patient Demographic segment in RSP messages. Patient identifier data returned in an RSP is limited by the CIR to the patient's name, date of birth, and sex; additional information is not allowed to be returned.

NK1 – Next of Kin Segment

The CIR HL7 Web Service will not include a NK1 segment in RSP messages. Patient identifier data returned in an RSP is limited by the CIR to the patient's name, date of birth, and sex; additional information is not allowed to be returned.

PV1 – Patient Visit Segment

The CIR HL7 Web Service will not include a Patient Visit segment in RSP messages.

IN1 – Insurance Segment

The CIR HL7 Web Service will not include an Insurance segment in RSP messages.

ORC – Order Request Segment

The ORC and RXA segments are part of the Response Group. The Response Group will only be returned when a single matching patient is found.

If a patient has immunization history, the RSP returned by the CIR HL7 Web Service will include an ORC segment/RXA segment combination for each immunization. Each RXA must be preceded by an ORC.

If a patient has no immunizations on record, the immunization history portion of the RSP will include a single ORC segment/RXA segment combination where the RXA segment indicates no vaccine administered.

An ORC/RXA segment combination will also be returned for each recommendation included in the RSP message.

Table 7-6 Common Order Segment (ORC) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Order Control	ID	0119	[1..1]	[1..1]	R	R
2	Placer Order Number	EI		[0..1]	[0..0]	RE	X
3	Filler Order Number	EI		[1..1]	[1..1]	R	R
4	Placer Group Number	EI		[0..1]	[0..1]	O	O
5	Order Status	ID	0038	[0..1]	[0..1]	O	O
6	Response Flag	ID	0121	[0..1]	[0..1]	O	O
7	Quantity/Timing	TQ		[0..0]	[0..0]	X	X
8	Parent	EIP		[0..1]	[0..1]	O	O
9	Date/Time of Transaction	TS		[0..1]	[0..1]	O	O
10	Entered By	XCN		[0..1]	[0..0]	RE	X
11	Verified By	XCN		[0..1]	[0..1]	O	O
12	Ordering Provider	XCN		[0..1]	[1..1]	RE	RE
13	Enterer's Location	PL		[0..1]	[0..1]	O	O
14	Call Back Phone Number	XTN		[0..1]	[0..1]	O	O
15	Order Effective Date/Time	TS		[0..1]	[0..1]	O	O
16	Order Control Code Reason	CE		[0..1]	[0..1]	O	O
17	Entering Organization	CE		[0..1]	[0..1]	O	O
18	Entering Device	CE		[0..1]	[0..1]	O	O
19	Action By	XCN		[0..1]	[0..1]	O	O
20	Advanced Beneficiary Notice Code	CE	0339	[0..1]	[0..1]	O	O
21	Ordering Facility Name	XON		[0..1]	[0..1]	O	O
22	Ordering Facility Address	XAD		[0..1]	[0..1]	O	O
23	Ordering Facility Phone Number	XTN		[0..1]	[0..1]	O	O
24	Ordering Provider Address	XAD		[0..1]	[0..1]	O	O
25	Order Status Modifier	CWE		[0..1]	[0..1]	O	O
26	Advanced Beneficiary Notice Override Reason	CWE	0552	[0..1]	[0..1]	O	O
27	Filler's Expected Availability Date/Time	TS		[0..1]	[0..1]	O	O
28	Confidentiality Code	CWE	0177	[0..1]	[0..1]	O	O
29	Order Type	CWE	0482	[0..1]	[0..1]	O	O
30	Enterer Authorization Mode	CNE	0483	[0..1]	[0..1]	O	O
31	Parent Universal Service Identifier	CWE		[0..1]	[0..1]	O	O

ORC Field Usage Notes

ORC-1 Order Control (ID)

The CIR HL7 Web Service will value this field with “RE” as required by the CDC IG.

ORC-3 Filler Order Number (EI)

For ORC segments associated with immunization history, the CIR HL7 Web Service will value this field with the CIR's unique identifier for the immunization record.

Example:
ORC|RE||**123456^NYC-CIR**|

When the patient does not have an immunization history (i.e., there are no vaccines on record), the CIR HL7 Web Service will value this required field with "9999" (per the CDC IG).

Example:

ORC|RE||9999^NYC-CIR|

ORC-12 Order Provider (XCN)

For ORC segments associated with immunization history, the CIR HL7 Web Service will value this field with the name of the ordering provider associated with this immunization record, when available. (In the case of a historical immunization record where the ordering provider is not known, this field will not be valued. Also, when the patient does not have an immunization history (i.e., there are no vaccines on record), this field will not be valued.

For ORC segments associated with recommendations, this field will not be valued.

RXA – Pharmacy/Treatment Administration Segment

The ORC (parent) and RXA (child) segments are part of the Response Group. The Response Group will only be returned when a single matching patient is found. The RXA segment carries pharmacy administration data. Because ORC segments are allowed to repeat, an unlimited number of vaccinations may be included in a message. Each RXA must be preceded by an ORC.

If a patient has immunization history, the RSP will include an ORC segment/RXA segment combination for each immunization. The RXA segment will include the administration location, administration date, vaccine code, and vaccine description. If available, the RXA segment will also include the lot number, expiration date, and manufacturer associated with the immunization.

When the patient does not have an immunization history (i.e., there are no vaccines on record), only the forecast portion of the RSP will be returned.

Table 7-7 Pharmacy/Treatment Administration Segment (RXA) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Give Sub-ID Counter	NM		[1..1]	[1..1]	R	R
2	Administration Sub-ID Counter	NM		[1..1]	[1..1]	R	R
3	Date/Time Start of Administration	TS		[1..1]	[1..1]	R	R
4	Date/Time End of Administration	TS		[0..1]	[1..1]	RE	R
5	Administered Code	CE	0292	[1..1]	[1..1]	R	R
6	Administered Amount	NM		[1..1]	[1..1]	R	R
7	Administered Units	CE	UCUM	[0..1]	[0..1]	C(R/X)	C(R/X)
8	Administered Dosage Form	CE		[0..1]	[0..1]	O	O
9	Administration Notes	CE	NIP0001	[0..*]	[0..0]	RE	X
10	Administering Provider	XCN		[0..1]	[0..0]	RE	X
11	Administered-at Location	LA2		[0..1]	[0..1]	RE	RE
12	Administered Per (Time Unit)	ST		[0..1]	[0..1]	O	O
13	Administered Strength	NM		[0..1]	[0..1]	O	O
14	Administered Strength Units	CE		[0..1]	[0..1]	O	O
15	Substance Lot Number	ST		[0..*]	[0..1]	RE	RE
16	Substance Expiration Date	TS		[0..1]	[0..1]	C(RE/O)	RE
17	Substance Manufacturer Name	CE	0227	[0..*]	[0..1]	RE	RE
18	Substance/Treatment Refusal Reason	CE		[0..*]	[0..0]	C(R/X)	X
19	Indication	CE		[0..1]	[0.10]	O	O
20	Completion Status	ID	0322	[0..1]	[0..0]	RE	R
21	Action Code - RXA	ID	0323	[0..1]	[0..0]	RE	X
22	System Entry Date/Time	TS		[0..1]	[0..1]	O	O
23	Administered Drug Strength Volume	NM		[0..1]	[0..1]	O	O
24	Administered Drug Strength Volume Units	CWE		[0..1]	[0..1]	O	O
25	Administered Barcode Identifier	CWE		[0..1]	[0..1]	O	O
26	Pharmacy Order Type	ID	0480	[0..1]	[0..1]	O	O

RXA Field Usage Notes

RXA-1 Give Sub-ID Counter (NM)

The CIR HL7 Web Service will value this field with “0” as required by the CDC IG.

RXA-2 Administration Sub-ID Counter (NM)

The CIR HL7 Web Service will value this field with “1” as required by the CDC IG.

> Note that the previous Implementation Guide suggested that this be used for indicating dose number. This use is no longer supported.

RXA-3 Date/Time Start of Administration (TS_NZ)

For RXA segments associated with immunization history, the CIR HL7 Web Service will value this field with the date of administration.

When the patient does not have an immunization history (i.e., there are no vaccines on record), this field will be valued with the date of the RSP message.

For RXA segments associated with recommendations, this field will be valued with the date of the RSP message.

RXA-4 Date/Time End of Administration (If Applies) (TS)

For RXA segments associated with immunization history, the CIR HL7 Web Service will value this field with the date of administration. When the patient does not have an immunization history (i.e., there are no vaccines on record), this field will be valued with the date and time of the RSP message.

For RXA segments associated with recommendations, the CIR HL7 Web Service will value this field with the date and time of the RSP message.

RXA-5 Administered Code (CE)

For RXA segments associated with immunization history, the CIR HL7 Web Service will value this field with the CVX code associated with the administered vaccine. If no vaccines have been recorded, the CIR HL7 Web Service will value this field with “998^no vaccine admin^CVX” as per the instructions in the CDC IG.

For RXA segments associated with recommendations, the CIR HL7 Web Service will value this field with “998^no vaccine admin^CVX” as per the instructions in the CDC IG.

RXA-6 Administered Amount (NM)

The CIR returns the administered amount if reported.

RXA-7 Administered units (CE)

The CIR returns administered units if administered amount is provided.

RXA-15 Substance Lot Number (ST)

The CIR HL7 Web Service will value this field when a lot number is associated with the vaccination. Currently the CIR stores and reports a single lot number.

> In an upcoming enhancement, the CIR database will be modified to store multiple lot numbers. The CIR HL7 Web Service will then be modified to report multiple lot numbers, when applicable; the first repetition will be the lot number associated with the vaccine.

For RXA segments associated with recommendations, this field will not be valued.

RXA-16 Substance Expiration Date (TS)

If there is a lot number associated with the vaccination, the CIR HL7 Web Service will value this field with the corresponding expiration date, if available. The format will be YYYYMMDD.

For RXA segments associated with recommendations, this field will not be valued.

RXA-17 Substance Manufacturer Name (CE)

The CIR HL7 Web Service will value this field when a manufacturer is associated with the vaccination. The value will be one of the MVX codes in HL7-defined (and CDC maintained) Table 0227.

For RXA segments associated with recommendations, this field will not be valued.RXA-20 Completion Status (ID)

The CIR HL7 Web Service will value this field with a completion status code of “CP” for complete.

RXR – Pharmacy/Treatment Route Segment

The CIR HL7 Web Service will not include a RXR segment in RSP messages.

OBX – Observation Segment

The OBX segment is also part of the Response Group. The Response Group will only be returned when a single matching patient is found.

In an RSP, the OBX segment carries observations associated with the RXA or immunization record. The basic format is a question (OBX-3) and an answer (OBX-5).

Table 7-8 Observation Segment (OBX) in an RSP

SEQ	Element Name	Data Type	Value Set	CDC IG Cardinality	CIR HL7 Web Service Cardinality	CDC IG Usage	CIR HL7 Web Service Usage
1	Set ID – OBX	SI		[1..1]	[1..1]	R	R
2	Value Type	ID	0125	[1..1]	[1..1]	R	R
3	Observation Identifier	CE		[1..1]	[1..1]	R	R
4	Observation Sub-ID	ST		[1..1]	[1..1]	RE	R
5	Observation Value	varies		[1..1]	[1..1]	R	R
6	Units	CE	UCUM	[0..1]	[0..0]	C(R/O	X
7	References Range	ST		[0..1]	[0..1]	O	O
8	Abnormal Flags	IS	0078	[0..1]	[0..1]	O	O
9	Probability	NM		[0..1]	[0..1]	O	O
10	Nature of Abnormal Test	ID	0080	[0..1]	[0..1]	O	O
11	Observation Result Status	ID	0085	[1..1]	[1..1]	R	R
12	Effective Date of Reference Range Values	TS		[0..1]	[0..1]	O	O
13	User Defined Access Checks	ST		[0..1]	[0..1]	O	O
14	Date/Time of the Observation	TS_NZ		[1..1]	[1..1]	R	R
15	Producer's Reference	CE		[0..1]	[0..1]	O	O
16	Responsible Observer	XCN		[0..1]	[0..1]	O	O
17	Observation Method	CE		[0..1]	[0..1]	O	O
18	Equipment Instance Identifier	EI		[0..1]	[0..1]	O	O
19	Date/Time of the Analysis	TS		[0..1]	[0..1]	O	O
20	Reserved for harmonization with V2.6			[0..1]	[0..1]	O	O
21	Reserved for harmonization with V2.6			[0..1]	[0..1]	O	O
22	Reserved for harmonization with V2.6			[0..1]	[0..1]	O	O
23	Performing Organization Name	XON		[0..1]	[0..1]	O	O
24	Performing Organization Address	XAD		[0..1]	[0..1]	O	O
25	Performing Organization Medical Director	XCN		[0..1]	[0..1]	O	O

OBX Field Usage Notes

OBX-1 Set ID OBX (SI)

This field contains the sequence number.

For each OBX under an RXA, the CIR HL7 Web Service will value the first OBX with "1"; each subsequent OBX will be valued with the next number in sequence. The OBX Set ID numbering schema will restart at "1" for the next set of OBX segments (under the next RXA segment).

OBX-2 Value Type (ID)

The CIR HL7 Web Service will value this field with the data type (e.g., CE, ID, ST, or DT) that corresponds to the format of the observation value (OBX-5). For example, if the OBX-2 value is "CE" then the OBX-5 value will be a coded entry.

Value Type	Used with CIR HL7 Supported Observation(s)
CE	Component Vaccine Type (38890-0), Vaccine Due Next (30973-2), Reason applied by forecast logic to project this vaccine (30982-3), Immunization Schedule used (59779-9), Vaccine Type (30956-7) , next vaccine recommended due (30979-9), Vaccine group recommendation status (59783-1)
DT	Date next dose is recommended (30980-7), Earliest date next vaccine allowed (30981-5), Date when next vaccine dose is overdue (59778-1)
ID	Dose Validity (59781-5)

Example:
OBX|2|**CE**|38890-0^COMPONENT VACCINE TYPE^LN|1|**45^HEP B, NOS^CVX**||||||F
OBX|3|**DT**|30980-7^Date vaccination due^LN|1|**20091231**||||||F

OBX-3 Observation Identifier (CE)

This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). Example: |**30980-7^Date vaccine due^LN**|.

OBX-3 may be thought of as a question that the observation (OBX-5) answers. In the example above, the question is "When is the next dose of this vaccine due (recommended)?" The answer in OBX-5 could be "20130714".

The CIR HL7 Web Service will populate this field with the corresponding identifier for each of the following CIR HL7 Web Service supported observations:

- **Observations Related to Immunization History**:
  - Vaccine Component Administered: **|38890-0^Component Vaccine Type^LN|**
    - OBX-5 sample answer: |45^Hep B, NOS^CVX|

- Evaluation (i.e., was this shot valid?): **|59781-5^Dose Validity^LN|**
  - OBX-5 sample answer: |Y| or **|**N|
- Why a Shot is Not Valid: **|30982-3^Reason applied by forecast to project this vaccine^LN|**
  - OBX-5 sample answer: |1005^This immunization event occurred prior to the recommended age or recommended interval for this dose.^NYCDOHINVSHOTCODES|
  - The CIR HL7 Web Service will only return a reason when a shot is invalid. A list of available reasons is listed in User-defined Table 0537. .
- Immunization Schedule Used: **|59779-9^Immunization Schedule used^LN|**
  - OBX-5 answer: |VXC16^ACIP^CDCPHINVS|
  - While the ACIP schedule is used for all evaluations, the CIR HL7 Web Service will only return this observation when a shot is invalid.
- Serologic evidence of immunity: **|59784-9^Disease with presumed immunity^LN|**
  - OBX-5 sample answer: |341112008^Serology confirmed varicella^SCT|
- History of Disease as evidence of immunity: **|75505-8 Diseases with serological evidence of immunity^LN|**
  - OBX-5 sample answer: |38907003^History of Varicella Infection^SCT|

- **Observations Related to Recommendations/Forecasting**:
  - Recommended Vaccine: **|30979-9^Vaccine due next^LN|**
    - OBX-5 sample answer: |88^influenza, NOS^CVX|
  - Date Next Dose is Recommended for this Vaccine: **|30980-7^Date vaccine due^LN|**
    - OBX-5 sample answer: |20110901|
  - Immunization Schedule Used: **|59779-9^Immunization Schedule used^LN|**
    - OBX-5 answer: |VXC16^ACIP^CDCPHINVS|
  - Date when next dose is considered overdue: **|59778-1^Overdue date^LN|**
    - OBX-5 answer: |20310203|
  - Earliest possible date the next dose of this vaccine could be given: **|30981-5^Earliest date^LN|**
    - OBX-5 answer: |20290107|
  - Vaccine group recommendation status: **|59783-1^Vaccine Group Recommendation Status^LN|**
    - OBX-5 answer: |LA13421-5^Complete^LN|
    - Currently allowed LOINC codes supported by the CIR include (formatted as will be provided in OBX-5)
      - LA13421-5^Complete^LN

- LA13422-3^On Schedule^LN
- LA13423-1^Overdue^LN
- LA13424-9^Too old - cannot complete the series because the latest age for receiving dose has passed^LN
- LA4695-8^No longer Recommended^LN

The 2.3.1 Implementation Guide used suffixes on the first sequence in OBX-3 to group related observations. For instance, reporting a vaccine due date for a recommended vaccine added a suffix of one LOINC code to a second LOINC code, e.g., 30979-9 (vaccine due next) + 30980-7 (date vaccine due) represented as 30979-9&30980-7^DATE VACCINE DUE^LN. This is no longer acceptable. Grouping of related observations will be accomplished using Observation sub-id (OBX-4).

OBX-4 Observation Sub-ID (ST)

This field is used to group related observations by setting the value to the same number.

Each related observation would share an Observation sub-id.

For example:
ORC|RE||137614337^NYC-CIR|||||||||^IMMUNIZER^DOCTOR|
RXA|0|1|20120601|20120601|110^DTaP/HepB/IPV (Pediarix)^CVX|999|||||||||20050810-01|19201231|PD^Parkedale Pharmaceuticals (formerly Parke-Davis)^MVX|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP, 5 pertussis antigen^CVX||||||F|
OBX|2|CE|38890-0^Component Vaccine Type^LN|2|10^IPV^CVX||||||F|
OBX|3|CE|38890-0^Component Vaccine Type^LN|3|08^Hep B, adolescent or pediatric^CVX||||||F|
OBX|4|ID|59781-5^Dose Validity^LN|3|N||||||F|
OBX|5|CE|30982-3^Reason applied by forecast logic to project this vaccine^LN|3|1004^This immunization event occurred prior to the recommended age or recommended interval for this dose.^NYCDOHINVSHOTCODES||||||F|
OBX|6|CE|59779-9^Immunization Schedule used^LN|3|VXC16^ACIP^CDCPHINVS||||||F|
ORC|RE||9999^NYC-CIR |
RXA|0|1|20220809104907|20220809104907|998^No vaccine administered^CVX|999|||||||||||||NA| OBX|1|CE|30979-9^Vaccine due next^LN|1|88^influenza, NOS^CVX||||||F|
OBX|2|DT|30980-7^Date vaccine due^LN|1|20120901||||||F|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|

OBX-5 Observation Value (varies)

This field contains the observation (answer) posed by the question in OBX-3 (Observation Identifier). OBX-2 (Value Type) contains the data type for this field. For a list of observations returned by the CIR HL7 Web Service, see the field usage notes for OBX-3.

OBX-11 Observation Result Status (ID)

The CIR HL7 Web Service will value this field with “F” (Final).

OBX-14 Date/Time of the Observation (TS_NZ)

This field represents the time of the observation. It is the physiologically relevant date-time or the closest approximation to that date-time of the observation.

The CIR HL7 Web Service will value this field with the date and time the immunization history was accessed, and the recommendation was generated, which is also the date and time of the RSP message.

NTE – Notes Segment

The CIR HL7 Web Service will not include a NTE segment in RSP messages.

8. File and Batch Segments (FHS, FTS, BHS, BTS)

The CIR HL7 Web Service does not support sending or receiving messages in batches. If a FHS, FTS, BHS, or BTS segment is sent by the HL7 Data Exchange Partner, the entire segment will be ignored by the CIR HL7 Web Service.

9. Change History

Version 1.1 – Release Date 2/7/2013

Location of Change	Change
Chapter: Appendix C Section: Connectivity Test	Modified the NYC DOHMH website URL

Changes documented by: Regina Austin

Version 1.2 – Release Date 10/28/2015

Location of Change	Change
Chapter: Introduction Section : CIR HL7 Web Service Operations	Updated the WSDL URLs. • For UAT (the test environment), use this URL to get to the WSDL: https://immunize.nyc/hl7-service-uat/services/CirService?wsdl • For Production, use this URL to get to the WSDL: https://immunize.nyc/hl7-service-prod/services/CirService?wsdl
Chapter: Appendix C Section: Connectivity Test	Updated screen shots to reflect the new URLs.

Changes documented by: Regina Austin

Version 1.3 – Release Date 08/15/2016

Location of Change	Change
Chapter: Introduction – Citywide Immunization Registry	• Removed this sentence: "Immunization records for individuals age 19 and above can also be reported to the CIR with written consent from the patient." • Replaced with: "Immunization records for individuals 19 years of age and older should be reported to the CIR when the patient gives consent (oral or written) for the report. Patient consent is not reported to the CIR."
Chapter: Supported HL7 Message Types Section: VXU – Unsolicited Vaccination Update Grammar	• The following changes were made to the Order Group: o Cardinality changed from [1..*] to [0..*] o Usage changed from R to RE o Comment update to "Each VXU may have zero or more Order Groups. If the VXU contains one or more Order Groups, at least one of those Order Group must be successful (i.e., contain no fatal errors); otherwise, the VXU message will be rejected."

Location of Change	Change
Chapter: Unsolicited Vaccination Update (VXU) Section: Overview	• Added: "While most VXU messages are used to report immunizations, an HL7 Data Exchange Partner can also utilize VXU messages to report (i.e., add) or delete an observation, such as serological evidence of immunity or history of disease as evidence of immunity." • Replaced: "At least one valid ORC/RXA segment pair is required per VXU." with "When a VXU message is sent to add or delete an immunization or an evidence of immunity observation, the VXU message must contain at least one valid Order Group (i.e., corresponding ORC, RXA, and, when applicable, OBX segment that contains no fatal errors). " • Added: "If there are errors within an Order Group that make it unclear whether the Order Group is being sent to report/delete an immunization or whether the Order Group is being sent to report/delete an evidence of immunity observation, the CIR HL Web Service will consider that the Order Group is attempting to report/delete an immunization and will return errors accordingly.
Chapter: Unsolicited Vaccination Update (VXU) Section: Evidence of Immunity Observations	• New overview section added to support reporting and deleting evidence of immunity observations (history of disease as evidence of immunity and serological evidence of immunity).
Chapter: Unsolicited Vaccination Update (VXU) Section: MSH-4 Field Usage Notes	• The HL7 Web Services requires MSH-4.1 to be valued with the Facility Code that was assigned by the NYC DOHMH. Providing additional data in MSH-4 previously caused the message to be rejected. Now the CIR HL7 Web Service will only process MSH-4.1 (Namespace ID); it will ignore data in all other MSH-4 components.
Chapter: Unsolicited Vaccination Update (VXU) Section: MSH-7 Field Usage Notes	• Added: "When a VXU is sent to report evidence of immunity, the date provided in MSH-7 will also be used to record the date the observation was reported to the CIR."
Chapter: Unsolicited Vaccination Update (VXU) Section: PID-10 Field Usage Notes	Corrected example. o Was: |^^^2106-3^White^HL70005| o Now: |2106-3^White^HL70005|
Chapter: Unsolicited Vaccination Update (VXU) Section: PID-13 Field Usage Notes	• Added support for cell phone number • Added support for email address
Chapter: Unsolicited Vaccination Update (VXU) Section: PID-22 Field Usage Notes	• Added support for numeric ethnicity codes • Continued to support alpha ethnicity codes

Location of Change	Change
Chapter: Unsolicited Vaccination Update (VXU) Section: NK1-2 Field Usage Notes	• Added support for sending mother's DOB when only the DOB is known (i.e., mother's name is not known/sent). The mother's DOB will be stored as an attribute of the patient; a next of kin/legal contact person record will not be added or updated. • A Last Name or First Name is still required to add/update a next of kin record in the CIR database.
Chapter: Unsolicited Vaccination Update (VXU) Section: NK1-5 Field Usage Notes	• Added support for cell phone number • Added support for email address
Chapter: Unsolicited Vaccination Update (VXU) Section: ORC-12 Field Usage Notes	• Added support for NPI as ID • Continued to support license number as ID, but tightened validation rules • Updated to support observation reporting of history of disease with presumed immunity or serological evidence of immunity
Chapter: Unsolicited Vaccination Update (VXU) Section: RXA-3 Field Usage Notes	• When reporting (or deleting) an immunization, RXA-3 is a required field; however, when reporting (or deleting) serological evidence of immunity or history of disease as evidence of immunity, RXA-3 (date of administration) is ignored by the CIR HL7 Web Service.
Chapter: Unsolicited Vaccination Update (VXU) Section: RXA-5 Field Usage Notes	• Added support for code "998" (no vaccine administered) when reporting/deleting evidence of immunity.
Chapter: Unsolicited Vaccination Update (VXU) Section: RXA-20 Field Usage Notes	• Added support for Completion Status code of "NA" and corresponding business rules when reporting/deleting history of disease with presumed immunity or serological evidence of immunity observations.
Chapter: Unsolicited Vaccination Update (VXU) Section: RXA-21 Field Usage Notes	• Updated notes to include support for deleting evidence of immunity observations.
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-3 Field Usage Notes	• Added support for: o history of disease with presumed immunity o serological evidence of immunity
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-5 Field Usage Notes	• Added support for: o history of disease with presumed immunity o serological evidence of immunity
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-14 Field Usage Notes	• Added support for Date/Time of the Observation when reporting and deleting evidence of immunity observations (history of disease as evidence of immunity and serological evidence of immunity).
Chapter: Message Acknowledgement (ACK) Section: MSH-9 Field Usage Notes	Corrected value returned by the CIR HL7 Web Service. o Was: |ACK^V04^ACK_V04| o Now: |ACK^V04^ACK|

Location of Change	Change
Chapter: Query by Parameter (QBP) Section: MSH-4 Field Usage Notes	• The HL7 Web Services requires MSH-4.1 to be valued with the Facility Code that was assigned by the NYC DOHMH. Providing additional data in MSH-4 previously caused the message to be rejected. Now The CIR HL7 Web Service will only process MSH-4.1 (Namespace ID); it will ignore data in any other MSH-4 component.
Chapter: Query by Parameter (QBP) Section: QPD-8 Field Usage Notes	• The HL7 Web Service expected behavior is that if any QPD-8 (Patient Address) component is valued then all of the following components must be valued: Street Address (QPD-8.1.1), City (QPD-8.3), State (QPD-8.4), and Zip (QPD-8.5); otherwise, the address will not be included in the patient search and a non-fatal error will be reported for each omitted address component. At some point, however, a bug was introduced that caused the QBP to fail due to a required field missing error if a partial address was sent. That bug has been fixed in this release.
Chapter: Appendix A Code Tables Section: Manufacturer Codes	• Updated this table to include additional MVX codes accepted by CIR as of the publication of this version of the IG.
Chapter: Appendix A Code Tables Section: Vaccine Administration (CVX) Codes	• Added non-vaccine code 998. ○ Code 998 is used in RXA-5 when reporting history of disease as evidence of immunity and serological evidence of immunity in an OBX segment that is nested with the RXA segment, but the RXA/OBX pair does not contain information about a vaccine administration.
Chapter: Appendix A Code Tables Section: Completion Status	• Added “NA” the Completion Status table of supported codes.

Chapter: Appendix A Code Tables
Section: Application Error Code
	• Three new error codes were added to support reporting and deleting evidence of immunity observations:
	  ○ DiseaseImmunity_Delete_Under_Review
	  ○ DiseaseImmunity_Not_Found
	  ○ ObservationDateBeforePatientDOB
	• One new error code was added to support OBX-14:
	  ○ ObservationDateBeforePatientDOB
	• One new error code was added to support MSH-7:
	  ○ MessageDateBeforePatientDOB
	• The description/example for the RequiredField error code was revised; the sentence “If the field is in an RXA segment, that RXA segment will be disregarded but the message will still be accepted as long as there is at least one valid ORC/RXA segment pair within the VXU message.” was removed.

Location of Change	Change
Chapter: Appendix A Code Tables Section: Observation Identifiers	• Added the following LOINC codes: ○ 59784-9 (for reporting history of disease with presumed immunity) ○ 75505-8 (for reporting serological evidence of immunity).
Chapter: Appendix A Code Tables Section: History of Disease as Evidence of Immunity	• A table was added to list the PHVS History of Disease as Evidence of Immunity (IIS) codes currently supported by the CIR HL7 Web Service.
Chapter: Appendix B Example Messages Section: VXU	• Updated sample message and storyboard to include: ○ Evidence of immunity observations ○ NPI number ○ Cell phone number ○ Email address
Chapter: Appendix B Example Messages Section: ACK	• Updated sample messages and storyboards to include support for NPI numbers.
Chapter: Appendix B Example Messages Section: RSP	• Updated sample message and storyboard to include vaccine not recommended due to previously reported evidence of immunity observation
Chapter: Appendix C Section: Connectivity Test	• Updated the URLs for Steps 1a, 1b • Updated instructions for Step 2
Various - throughout document	Non-substantive typographical corrections

Changes documented by: Regina Austin

Version 1.4 – Release Date 06/08/2017

Location of Change	Change
Chapter: Unsolicited Vaccination Update (VXU) Section: PD1 Segment (PD1-12 and PD1-13 Field Usage Notes)	• Added support for protection indicator (PD1-12) and protection indicator effective date (PD1-13).
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-3 Field Usage Notes	• Added support for vaccine funding source.
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-5 Field Usage Notes	• Added support for vaccine funding source.
Chapter: Appendix A Code Tables Section: Table NIP003	• Added LOINC Code 30963-3 to support reporting of vaccine funding source.
Chapter: Appendix A Code Tables Section: Table PHVS	• Added a new PHVS Table for Immunization Funding Source

Location of Change	Change
Chapter: Unsolicited Vaccination Update (VXU) Section: PD1 Segment (PD1-12 and PD1-13 Field Usage Notes)	• Added support for protection indicator (PD1-12) and protection indicator effective date (PD1-13).
Chapter: Appendix A Code Tables	• Added error codes to Table 0533 related to possible errors returned for PD1-12 and PD1-13.
Chapter: Appendix B Example Messages Section: VXU	• Added storyboard and example message for adult patient reported to CIR with protection indicator.
Chapter: Appendix B Example Messages Section: VXU	• Added funding source to existing storyboard and example messages.

Version 2.0 – Release Date 02/03/2021

Location of Change	Change
Chapter: Unsolicited Vaccination Update (VXU) Section: MSH-22 – Field Usage Notes	• Added support for Sending Responsible Organization (MSH-22)
Chapter: Unsolicited Vaccination Update (VXU) Section: PID-8 -- Field Usage Notes	• Added support for values of Unknown (“U”) for Administrative Sex (PID-8)
Chapter: Unsolicited Vaccination Update (VXU) Section: PID-10 -- Field Usage Notes	• Added support for “Two or More Races” and “Prefer Not to Answer” values for Race (PID-10)
Chapter: Unsolicited Vaccination Update (VXU) Section: PID-22 -- Field Usage Notes	• Added support for “Prefer Not to Answer” value for Ethnic Group (PID-22)
Chapter: Unsolicited Vaccination Update (VXU) Section: NK1-3 -- Field Usage Notes	• Added support for additional values for relationship type
Chapter: Unsolicited Vaccination Update (VXU) Section: RXR—Pharmacy/Treatment Route Segment	• Added support for Route (RXR-1) and Administration Site (RXR-2)
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-3 – Field Usage Notes	• Added support for Public Health Emergency Event and Priority Group, used for COVID-19 Reporting
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-5 – Field Usage Notes	• Added support for Public Health Emergency Event and Priority Group, used for COVID-19 Reporting
Chapter: Query by Parameter (QBP) Section: MSH-10 – Field Usage Notes	• Added support for return of Patient ID in Message Control ID (MSH-10) for RSP messages
Chapter: Query by Parameter (QBP) Section: MSH-21 – Field Usage Notes	• Updated CIR HL7 Web Service Usage for Message Profile Identifier (MSH-21)
Chapter: Query by Parameter (QBP) Section: QPD-1 – Field Usage Notes	• Added fatal error is returned when Message Query name (QPD-1) is not valued or invalid
Chapter: Query Response (RSP) Section: Overview	• Added support for QBP messages using Z44 profile
Chapter: Query Response (RSP) Section: PID Field Usage Notes	• Added support for Set ID – PID (PID-1) • Added support for Medical Record Number in Patient Identifier List (PID-3) • Added support for returning Assigning Authority (PID-3.4) • Added support for Patient Address (PID-11)
Chapter: Query Response (RSP) Section: OBX-3 – Field Usage Notes	• Added support for return of both LOINC and CIR codes for OBX-3 when OBX-3 is “Vaccine Group Recommendation Status”
Chapter: Query Response (RSP) Section: RXA-20 – Field Usage Notes	• Added support for return of Completion Status (RXA-20)
Chapter: Appendix A: Code Tables Section: User-defined table 0063 - Relationship	• Updated values for User-defined table 0063 - Relationship

Chapter: Appendix A: Code Tables Section: HL7-defined table 0162 – Route of Administration	• Added HL7-defined table 0162 - Route of Administration
Chapter: Appendix A: Code Tables Section: HL7-defined table 0163 – Administrative Site	• Added HL7-defined table 0163 – Administrative Site
Chapter: Appendix A: Code Tables Section: NIP-defined Table NIP003 – Observation Identifiers	• Added value 59784-9 in Returned in RSP table • Added value 75505-8 in Returned in RSP table • Added value 59783-1 in Returned in RSP table
Chapter: Appendix A: Code Tables Section: User-defined table - 0534 Priority Group	• Added User-defined table 0534 – Priority Group

Version 2.1 – Release Date 03/18/2021

Chapter: Unsolicited Vaccination Update (VXU) Section: PID-8 -- Field Usage Notes	• Added support for additional values for Administrative Sex (PID-8)
Chapter: Query by Parameter (QBP) Section: QPD-7 – Field Usage Notes	• Added support for additional values for Administrative Sex (QPD-7
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-3 – Field Usage Notes	• Added support for Gender Identity and Sexual Orientation
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-5 – Field Usage Notes	• Added support for Gender Identity and Sexual Orientation
Chapter: Appendix A: Code Tables Section: User-defined table – 0001 Administrative Sex	• Updated values for User-defined table 0001 – Administrative Sex
Chapter: Appendix A: Code Tables Section: User-defined table - 0534 Priority Group	• Updated values User-defined table 0534 – Priority Group
Chapter: Appendix A: Code Tables Section: User-defined table – 0535 Gender Identity	• Added User-defined table 0535 – Gender Identity
	•

Version 2.2 – Release Date 03/10/2022

Location of Change	Change
Chapter: Introduction Section: Citywide Immunization Registry	• COVID vaccinations are required to be reported for all ages with or without consent.
Chapter: Introduction Section: CIR Security Information	• Encryption details: Data in transit is secured via TLS. Backups at rest are AES-256 encrypted. The database connection is AES-256 encrypted. We require TLS version 1.2 protocol.
Chapter: CIR HL7 Web Service Operations Section: Supported HL7 Message Types	• QBP reference updated to reflect *both query types:* Z34 and Z44 profiles throughout the Guide • RSP Query response grammar will only return one patient match.

Location of Change	Change
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: MSH	• MSH-6 New recommendation to populate this field with NYC DOHMH • MSH-22 A non-fatal error will not be returned if this field is left blank
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: PID	• PID-3, Patient Identifier o Describes what CIR will support/not support o Describes impact on other relevant fields in other segments if PID-3 is not populated o PID-3 CIR does not *require* the Medical Record Number o Describes what is returned in RSP • PID-5, Patient Name o Accepted/unaccepted values o Fields may not begin with a number. • PID-8, Administrative Sex o No longer required o Table of supported values provided. o Unsupported or empty values will result in a non-fatal error reported • PID-10, Race o Describes accepted governmental values plus two CIR internally created values • PID-15, Primary Language o Added information on Primary Language Code set • PID-30, Patient Death Indicator o Will be ignored if not valued or value is other than 'Y'
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: NK1	• NK1-3, Relationship o If a relationship type, other than those provided in Table 0063 is valued, a non-fatal error will be reported o If a relationship type is not valued, a non-fatal error will be reported, and the NK1-3 field will be valued as 'OTH' (Other) o SEL-SELF values will be ignored o If multiple NK1 segments are sent with the same relationship type, but different patient names (NK1-2), the last NK1 segment will be accepted, and previous segments will be ignored
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: RXA	• RXA-5, Administered Code o Added updated description regarding of RXA-5.3 for the second triplet specifically pertaining to NDC codes o NDC codes will only be accepted if submitted as the *second triplet* o NCD codes will not be accepted alone
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: RXA	• RXA-21, Action code

Location of Change	Change
	○ Descriptions of how to submit Updates and Deletes
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: OBX Segment	• OBX-3, Observation Identifier ○ Additional OBX-3 Values added for reporting Patient Gender Identity, Sexual Orientation and two values for COVID-19 Reporting • OBX-5, Observation Result ○ Added descriptions for results associated to the OBX-3 additions, i.e., Patient Gender Identity, Sexual Orientation and COVID-19 Reporting
Chapter: Query by Parameter (QBP) Section: MSH Segment	• MSH-4, Sending Facility ○ Added rules associated with NYC DOHMH assigned values ○ Added rules associated with MSH-22 • MSH-22, Sending Responsible Organization added (RE) ○ Added rules associated with MSH-4.2
Chapter: Query by Parameter (QBP) Section: QPD Segment	• QPD-3, Patient List ○ Updated rules associated to medical record number changes • QPD-7, Patient Sex (RE) ○ Updated description of added values
Chapter: Query Response (RSP) In Response to a QBP message	• The CIR HL7 Web Service will always return both a patient's immunization history and recommendations for both Z34 and Z44 profile requests • Updated information on response to all identified types of matches, i.e., Single match, No Patients found, More than one patient found ○ Updated data to be provided when a single matching patient is found for both Z34 and Z44 profiles (Immunization History and Forecast)
Chapter: Query Response (RSP) In Response to a QBP message QAK Segment	• QAK-2, Query Response Status removed AE and AR
Chapter: Query Response (RSP) In Response to QBP message PID Segment	• Updated Accepted demographic information ○ PID-3, Patient Identifier List ○ PID-11, Patient Phone Number ▪ Clarification on types of communication
Chapter: Query Response (RSP) In Response to a QBP message RXA Segment	• RXA-6, Administered amount ○ The CIR collects the administered amount if reported • RXA-7, Administered units ○ The CIR collects and returns administered amount is provided

Version 2.3 – Release Date 09/25/2022

Location of Change	Change

Chapter: Supported HL7 Message Types	• Removed usage of 'Ignore (I)'
Chapter: Supported HL7 Message Types Section: Unsolicited Vaccine Update Grammar (VXU)	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 2-1
Chapter: Supported HL7 Message Types Section: Query by Parameter Grammar	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 2-3
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: MSH	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-1
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: PID	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-2
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: PD1	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-3.
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: NK1	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-4
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: ORC	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-5
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: RXA	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-6
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: RXR	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-7
Chapter: Unsolicited Vaccine Updates (VXU) Section: VXU Segment: OBX	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 3-8
Chapter: Query by Parameter (QBP) Section: MSH Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 4-1
Chapter: Query by Parameter (QBP) Section: QPD Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 4-2
Chapter: Query by Parameter (QBP) Section: RCP Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 4-3
Chapter: Message Acknowledgement (ACK) Section: MSH	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 5-1
Chapter: Message Acknowledgement (ACK) Section: MSA	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 5-2
Chapter: Message Acknowledgement (ACK) Section: ERR	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 5-3
Chapter: Query Response (RSP) In Response to a QBP message MSH Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-1
Chapter: Query Response (RSP) In Response to a QBP message MSA Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-2
Chapter: Query Response (RSP) In Response to a QBP message ERR Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-3
Chapter: Query Response (RSP) In Response to a QBP message QAK Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-4

Chapter: Query Response (RSP) In Response to a QBP message ORC Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-6
Chapter: Query Response (RSP) In Response to a QBP message RXA Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-7
Chapter: Query Response (RSP) In Response to a QBP message OBX Segment	• Corrected CDC cardinality and usage and updated CIR cardinality and usage in table 6-8
Chapter 3: Unsolicited Vaccination Update Updating Previously Reported Patient Demographic Details	• Added support for VXU messages with patient demographic details only
Appendix A: Code Tables PHVS – Immunization Funding Source	• Added VXC51 and VXC52 as supported values
Appendix A: Code Tables User-defined Table 0064 – Financial Class	• Added VX22 and V23 as supported values

Version 2.4 – Release Date 02/02/2023

Location of Change	Change
Chapter 2: HL7 Data Types	• Data type table added for reference
Various locations	• Updated time stamp for greater specificity
Chapter 4: Unsolicited Vaccination Update (VXU) – PD1 – Patient Demographic Segment – PD1-12 Protection Indicator	• Updated Protection Indicator rules such that the CIR no longer accepted blank PD1-12
Chapter 4: Unsolicited Vaccination Update (VXU) – RXA – Pharmacy/Treatment Administration Segment – RXA-6 Administered Amount	• CIR will enforce data validation rules for values populated in Administered Amount field.
Chapter 4: Unsolicited Vaccination Update (VXU) – RXA – Pharmacy/Treatment Administration Segment – RXA-9 Administration Notes	• CIR no longer accepts 04 – Historical information, from parent's or patient's recall
Chapter 7: Query Response (RSP) – RSP Message Segment	• CIR will only return forecast for a patient with no immunization history
Chapter 7: Query Response (RSP) – OBX-3 Observation Identifier (CE)	• Added support for LOINC codes: vaccine type, earliest due date and overdue date • CIR now returns serological evidence of immunity and historical evidence of immunity
Appendix A: Code tables – User-defined Table 0537 – Invalid dose reasons	• List of Invalid dose reasons added as table 0537

Version 2.5 – Release Date 05/08/2023

Location of Change	Change
Chapter 4: Unsolicited Vaccination Update (VXU) – VXU Message Segments – RXA-20 Completion Status	• Added support for refusals and partially administered doses.

Chapter 4: Unsolicited Vaccination Update (VXU) – VXU Message Segments – RXA-21 Completion Status	• Added support for vaccine updates
Appendix A: Code Tables – HL7-defined Table 0322 – Completion Status	• Added table values “PA” and “RE”
Appendix A: Code Tables – HL7-defined Table 0323 – Action Code	• Added table value “U”

Version 2.6 – Release Date 1/18/2024

Location of Change	Change
Chapter 4: Unsolicited Vaccination Update (VXU) - VXU Message Segments – PID-5 – Patient Name	• Added support for sending patient’s maiden name in PID-5 as name type “M”
Chapter 4: Unsolicited Vaccination Update (VXU) – VXU Message Segments – RXA-21 Completion Status	• Clarified definition and business rules of U action code
Chapter: Unsolicited Vaccination Update (VXU) Section: OBX-5 – Field Usage Notes	• Added support for Sexual Orientation
Chapter 6: Message Acknowledgement (ACK) – ACK Segments – MSH-10	• Changed definition of field to include Message ID
Chapter: Appendix A: Code Tables Section: User-defined table – 0535(2) Sexual Orientation	• Added User-defined table 0535(2) – Sexual Orientation

Version 2.7 – Release Date 7/5/2024

Location of Change	Change
Chapter: Introduction: HL7 Web Service Dashboard Section	• Introduction of new HL7 Web Service Dashboard
Chapter: Appendix A: Code Tables Section: User-defined table – 0533 Application Error Code	• One new error code was added: ○ PatientRecordBlocked_CannotBeUpdated_Reason VaccineDataAuthenticity
Chapter 4: Reporting Two Doses of CVX Code 307 to CIR	• Added support for reporting two doses of Nirsevimab, CVX Code 307 (Beyfortus) to CIR

Appendix A: Code Tables

Code Tables are only listed in this appendix if the CIR HL7 Web Service supports a subset of the codes or when the table is user-defined and contains CIR-specific codes.

Code Tables in this local implementation guide follow the order, layout, and format of the Code Tables in the CDC IG.

User-defined Table 0001 – Administrative Sex

Preferred Value	Value	Description	Definition	Constraints
F	F	Female	Person reports that she is female.	Allowed in VXU and QBP messages.
M	M	Male	Person reports that he is male.	Allowed in VXU and QBP messages.
U	U	Unknown	Unknown	Allowed in VXU and QBP messages.
	Values below are CIR defined codes			
D	UND	Undetermined / Undifferentiated	No assertion is made about the gender of the person	Allowed in VXU and QBP messages.
N	NFNM	Neither Female nor Male	Person reports as neither female nor male	Allowed in VXU and QBP messages.
P	PNTA	Prefer Not to Answer	Person prefers not to answer	Allowed in VXU and QBP messages.
O	OTH	Other	Person reports as other	Allowed in VXU and QBP messages.
A	NA	Not Asked	Person was not asked about administrative sex	Allowed in VXU and QBP messages.

In a QBP message, CIR supports all of the Administrative Sex codes listed above.

HL7-defined Table 0008 – Acknowledgement Code

Value	Description
AA	Application acknowledgement: Accept
AE	Application acknowledgement: Error
AR	Application acknowledgement: Reject

Acknowledgement codes are used in MSA-1. See the message specific, field definition portions of this IG for additional information regarding the CIR HL7 Web Service's usage of these codes.

User-defined Table 0063 - Relationship

Value	Description
BRO	Brother
CGV	Care giver
CHD	Child
FCH	Foster child
FTH	Father

GRD	Guardian
GRP	Grandparent
MTH	Mother
OTH	Other
PAR	Parent
SCH	Stepchild
SIB	Sibling
SIS	Sister
SPO	Spouse

Relationship codes are used in NK1-3. Value of "SEL – SELF" will be ignored by the CIR HL7 Web Service.

User-defined Table 0064 – Financial Class

Value	Description
V01	Not VFC eligible
V02	VFC eligible-Medicaid/Medicaid Managed Care
V03	VFC eligible-Uninsured
V04	VFC eligible-American Indian/Alaskan Native
V05	VFC eligible-Federally Qualified Health Center Patient (under-insured)
V06	Per the CDC IG, this code (previously used for CHPLUSB) has been deprecated; use V07.
V07	VFC eligible - State specific eligibility code. Use this code for "CHPLUS B" patients.
V08	VFC eligible - Incarcerated
V22	CHIP
V23	VFC eligible - 317 Funding

Financial Class (VFC Eligibility) codes are used in OBX-5.

HL7-defined Table 0076 – Message Type

Value	Description
ACK	General Acknowledgement
QBP	Query by Parameter
RSP	Response to Query by Parameter
VXU	Unsolicited Vaccination Record Update

Message Type codes are used in MSH-9.1 (first component).

HL7-defined Table 0155 – Accept/Application Acknowledgment Conditions

Value	Description
AL	Always
NE	Never

These codes are used in MSH-15 and MSH-16. See the message specific, field definition portions of this IG for additional information regarding the CIR HL7 Web Service's usage of these codes.

HL7-defined Table 0162 – Route of Administration

FDA NCI Thesaurus (NCIT) Value	HL7 0162 Value	Description	Definition
C38238	ID	Intradermal	within or introduced between the layers of the skin
C28161	IM	Intramuscular	within or into the substance of a muscle
C38284	NS	Nasal	Given by nose
	IN	~~Intranasal~~	*{Do not use this older code}*
C38276	IV	Intravenous	administered into a vein
C38288	PO	Oral	administered by mouth
	OTH	Other/Miscellaneous	
C38676		Percutaneous	made, done, or effected through the skin.
C38299	SC	Subcutaneous	Under the skin or between skin and muscles.
C38305	TD	Transdermal	describes something, especially a drug, that is introduced into the body through the skin

HL7-defined Table 0163 – Administrative Site

Value	Description
LT	Left Thigh
LA	Left Arm
LD	Left Deltoid
LG	Left Gluteus Medius
LVL	Left Vastus Lateralis
LLFA	Left Lower forearm
RA	Right Arm
RT	Right Thigh
RVL	Right Vastus Lateralis

RG	Right Gluteus Medius
RD	Right Deltoid
RLFA	Right Lower Forearm

HL7-defined Table 0190 – Address Type

Value	Description
P	Permanent
C	Current

Address Type codes are used in PID-11 and QPD-8.

HL7-defined Table 0200 - Name Type

Value	Description	Definition
A	Alias name	This is a nickname or other assumed name.
L	Legal name	This is a person's official name. It is the primary name recorded in the IIS.
M	Maiden name	This is a woman's name before marriage.

Name type values allowed in PID-5 and QPD-4 (Patient Name): Legal (L) and Alias (A).
Name type value allowed in PID-6 (Mother's Maiden Name): Maiden (M).

HL7-defined Table 0201 – Telecommunication Use Code

Value	Description	Constraints
PRN	Primary Residence Number	Used in PID-13, NK1-5, and QPD-9
ORN	Other Residence Number	Used in PID-13 and NK1-5
EMR	Emergency Number	Used in PID-13 and NK1-5
NET	Network (Email) Address	Used in PID-13 and NK1-5
WPN	Work number	Used in NK1-6

HL7-defined Table 0202 – Telecommunication Equipment Type Codes

Value	Description	Constraints
PH	Phone	Used in PID-13, NK1-5, and QPD-9 with Telecommunication Use of "PRN" for Primary Residence. Used in NK1-6 with Telecommunication Use of "WPN" for Work.
CP	Cell Phone	Used in PID-13 and NK1-5 with Telecommunication Use of "PRN" for Primary Residence, "ORN" for Other Residence, and "EMR" for Emergency.
X.400	Email Address	Used in PID-13 and NK1-5 with Telecommunication Use of "NET" for Network (Email) Address.
Internet	Internet Address	Also allowed in PID-13 and NK1-5 with Telecommunication Use of "NET" for Network (Email) Address.

User-defined Table 0203 - Identifier Type

Value	Description	Constraints
LN	License Number	Used in ORC-12
LR	Local Registry ID (This is the CIR issued unique patient ID.)	Used in PID-3 and QPD-3
MA	Patient Medicaid Number	Used in PID-3 and QPD-3
MC	Patient Medicare Number	Used in PID-3 and QPD-3
MR	Medical Record Number	Used in PID-3 and QPD-3
NPI	National Provider Identifier	Used in ORC-12

HL7-defined Table 0227 – Manufacturer (MVX) Codes

The CIR accepts a sub-set of the MVX codes listed on the CDC's IIS HL7 Standard Code Set MVX page (http://www2a.cdc.gov/vaccines/IIS/IISStandards/vaccines.asp?rpt=mvx).

Manufacturer (MVX) codes are used in RXA-17.

HL7-defined Table 0292 – Vaccine Administration (CVX) Codes

The CIR accepts a sub-set of the CVX codes listed on the CDC's IIS HL7 Standard Code Set CVX page (http://www2a.cdc.gov/vaccines/IIS/IISStandards/vaccines.asp?rpt=cvx). The CVX codes accepted by the CIR in RXA-5.

HL7-defined Table 0322 – Completion Status

Value	Description
CP	Complete
NA	Not Administered
PA	Partially Administered
RE	Refusal

Completion Status is used in RXA-20.

HL7-defined Table 0323 – Action Code

Value	Description
A	Add
D	Delete
U	Update

Action Code is used in RXA-21.

HL7-defined Table 0516 – Error Severity

Value	Description	Comment
E	Error	Transaction was not successful.
W	Warning	Transaction was successful, but there may be issues. These issues may include non-fatal errors with potential for loss of data.

Error Severity is used in ERR-4.

User-defined Table 0533 – Application Error Code

Error Code	Description and Examples
BadDateTime	This error is returned when a date (e.g., message date/time, patient's date of birth, expiration date, etc.) is not in the expected format or is an invalid date.
BadFormat	This error is returned when a value is not in the expected format. Example: a Medicaid number in a format other than AA12345A, a Medicare number less than 10 characters, a zip code less than 5 digits, or a phone number less than 7 digits.
BadNumber	This error is returned when a numeric-only value is not in the expected format. Example: The Local Registry ID contains letters (CIR IDs are numeric-only).
DateInTheFuture	This error is returned when a date in the future is submitted in a date field that does not allow a future date. Example: patient's DOB or immunization administration date is a future date.

Error Code	Description and Examples
DateMoreThan14DaysAgo	This error is returned when the protection indicator effective date reported in the VXU (PD1-13) is greater than fourteen days prior to the current system date when the message is received by the CIR.
DiseaseImmunity_Delete_Under_ Review	If an HL7 data exchange partner requests that an evidence of immunity observation be deleted and a matching evidence of immunity observation is found but that matching evidence of immunity observation had been previously reported by a facility that is different from the facility that is specified in RXA-11.4.1, then the evidence of immunity observation will not be automatically deleted. Instead, the CIR HL7 Web Service returns this Delete Exception. The CIR HL7 Web Service also sends an alert to CIR staff that will eventually review the request and then process it if appropriate.
DiseaseImmunity_Not_Found	If an HL7 data exchange partner requests that an evidence of immunity observation be deleted and a matching evidence of immunity observation is not found, then the CIR HL7 Web Service returns this Delete Exception error.
GenericPatientFirstName	This error is returned when a VXU is submitted with a Generic Patient First Name (PID-5), less than 3 immunizations administered (# of RXA segments < 3), and the time between date of administration (RXA-3) and date of birth (NK1-16) is < 24 days and >= 0 days for each administered immunization.
ImmunizationDateBeforePatientDOB	As expected, this error type is returned when the immunization administration date (RXA-3.1) is prior to the patient's date of birth (PID-7.1).
InternalDbConfigError	This error indicates a problem with the CIR database.
MedicaidInEMIErrorList	This error is returned when an HL7 Partner submits a Medicaid number that is in the CIR's EMI_MEDICAID_NUMBER_ERROR_LIST table. This table contains a list of invalid "default" values, such as "XX99999X".
MedicalRecordInEMIErrorList	This error is returned when an HL7 Partner submits a Medical Record number that is in the CIR's EMI_PATIENT_NUMBER_ERROR_LIST table. This table contains a list of invalid "default" values, such as "by last name".
MessageDateBeforePatientDOB	As expected, this error type is returned when the message date (MSH-7) is prior to the patient's date of birth (PID-7.1).
Mismatch	This error type is reported when the code in the Sending Facility field (MSH-4.1) does not match the facility code associated with the account sending the message.
MomNotOldEnough	This error indicates a problem with either the mother's date of birth or the patient's date of birth (or both) and is reported when the mother's date of birth (NK1-16.1) is less than 10 years before the patient's date of birth (PID-7.1).
MotherMaidenInEMIErrorList	This error is returned when an HL7 Partner submits a Medical Record number that is in the CIR's EMI_MOTHER_MAIDEN_NAME table. This table contains a list of invalid "default" values, such as "unknown" or "none".
ObservationDateBeforePatientDOB	As expected, this error type is returned when the observation date (OBX-14.1) is prior to the patient's date of birth (PID-7.1).

Error Code	Description and Examples
Over120YearsOld	This error is returned when the date of the patient's birth (PID-7.1) indicates that the patient is over 120 years old at time of the immunization. (This, most likely, is caused by an incorrect date of birth.)
PatientNotAddedDueToProtectionIndicatorValue	This error is returned when the patient's record is in a protected state (PD1-12) in the CIR and a new VXU message is submitted or if a new adult patient is reported with PD1-12 indicating "protect".
PatientRecordBlocked_CannotBeUpdated_ReasonVaccineDataAuthenticity	This error is returned when a patient's vaccine record cannot be updated. For questions, follow up with the CIR to review how a patient's record can be updated in this situation.
RequiredField	This error is reported when a required field is not valued or cannot be accepted due to an invalid value. If the field is in an *optional segment* (e.g., NK1), that segment will be disregarded, but the message will still be accepted. If the field is in a *required segment* (e.g., MSH, PID), the message will be rejected.
RequiredSegment	This error is returned when a required segment is sent out of sequence (and therefore disregarded) or is missing.
TableValueNotFound	This error is returned when a submitted code value, such as a vaccine code (RXA-5.1), manufacturer code (RXA-17.1), language code (PID-15.1), race code (PID-10.1), relationship code (NK1-3.1), financial class code (OBX-5.1), or identifier type code (PID-3.5, QPD-3.5, ORC-12.13), is not listed as a valid code in the corresponding HL7 code table in the CIR database. See Appendix A: Code Tables of this IG.
Transliterated	This error is returned when a submitted value contains a non-ASCII character. These characters are transliterated to ensure successful parsing for both receiving and sending applications. A warning will be returned indicating which field was transliterated.
UnknownKeyIdentifier	The following are examples of unknown/invalid key data that will result in the return of this error: • Invalid/unknown CIR facility code in Sending Facility (MSH-4.1) • Invalid/unknown CIR facility code in Patient Birth Place (PID-23) • A valid CVX code but one that the CIR does not accept in Administered Code Identifier (RXA-5.1) • Order Provider (ORC-12) is not valued or contains errors, and a default provider has not been established for the corresponding facility code supplied in Administered-at LocationRXA-11.
UnsupportedProcessingId	This error will be returned when an HL7 Partner submits a Processing ID (MSH-11.1) value other than "P" (for a Production message) or "T" (for a Test message).

Error Code	Description and Examples
UnsupportedValue	This error will be returned when an unsupported value is received. For example, the only supported value for Immunization Administration Code – Name of Coding System (RXA-5.3) is "CVX"; all other values would result in an "UnsupportedValue" error. Also, if Field Separator (MSH-1) or Encoding Characters (MSH-2) fields are valued with other than the standard required values an "UnsupportedValue" error will be returned.
UnsupportedVersionId	This error will be returned when an HL7 Partner submits a Version ID (MSH-12.1) other than "2.3.1" or "2.5.1"; those are the only versions of HL7 that the CIR HL7 Web Service currently supports.
Vaccination_Delete_Under_Review	If an HL7 Partner requests that an immunization be deleted and a matching immunization is found but that matching immunization had been previously reported by a facility that is different from the facility that is specified in RXA-11.4.1, then the immunization will not be automatically deleted. Instead, the CIR HL7 Web Service returns this Delete Exception.
Vaccination_Not_Found	If an HL7 Partner requests that an immunization be deleted and a matching immunization is not found, then the CIR HL7 Web Service returns this Delete Exception error.
ValueExceedMaxLen	This error is returned when the value submitted exceeds the maximum character length allowed by the CIR database. In some cases, such as a patient name or street address, the submitted value is truncated to the maximum length allowed and the remaining characters are processed. In other cases, such as medical record number, area code, phone number, or lot number, the submitted value is disregarded.

Error Code	Description and Examples
ValueMissing	In general, if the CIR HL7 Web Service detects that an HL7 Partner is attempting to supply optional data but that data cannot be used or absorbed because corresponding data is missing, a ValueMissing error will be returned. If a value is missing in a required field, a RequiredField error type will be returned. There are some fields with an optionality of "RE" that are not required but should be known and therefore should be sent in an HL7 2.5.1 message, for example Sending Application (MSH-3.1), Ordering Provider (ORC-12), and Action Code (RXA-21). If these standard fields are not populated a non-fatal ValueMissing error will be returned. Additionally, there are other values (also optional) that must be supplied in combination in order for the data to be used by the CIR HL7 Web Service when searching for the patient and/or absorbing data into the CIR database. For example: • If a patient identifier is sent in PID-3.1 but the identifier type is missing in PID-3.5, (which would identify the number as a Medicaid, Medical Record, Local Registry ID, or some other identifier type), without the identifier type the patient identifier cannot be used to locate the patient or absorbed into the database and a ValueMissing error will be reported. • Another example is an NK1 segment that contains the next of kin data (name, phone number, date of birth, etc.) but does not include a relationship code to identify the next of kin as mother, father, or guardian. • The same is true if an OBX segment is sent as part of a VXU but OBX-3.1 and/or OBX-5.1 are not valued; without both OBX-3.1 and 5.1 it cannot be determined what question is being posed (OBX-3.1) and what the observation is that answers that question (OBX-5.1).

Application Error is used in ERR-5.

NIP-defined Table NIP003 – Observation Identifiers

Accepted in a VXU

Code (OBX-3)	Description	Data Type (OBX-2)	Example Response or Code Table to Use (OBX-5)
64994-7	Vaccine funding program eligibility category	CE	HL70064 – Financial Class
30963-3	Vaccine funding source	CE	PHVS – Immunization Funding Source (IIS)
59784-9	Disease with presumed immunity	CE	PHVS - History of Disease as Evidence of Immunity (IIS)
75505-8	Disease with serological evidence of immunity	CE	PHVS - Serological Evidence of Immunity (IIS)
76691-5	Gender Identity	CE	LN
76690-7	Sexual Orientation	CE	STC

Returned in an RSP

Code (OBX-3)	Description	Data Type (OBX-2)	Example Response or Code Table to Use (OBX-5)	What is conveyed when returned in an RSP
38890-0	Component Vaccine Type	CE	HL70292 – CVX Codes	Vaccine administered
59781-5	Dose Validity	ID	N	Shot was invalid
30982-3	Reason applied by forecast to project this vaccine	CE	NYCDOH INV SHOT Codes	Reason shot was invalid
59779-9	Immunization Schedule used	CE	VXC16^ACIP^CDCPHINVS	ACIP schedule was used
59784-9	Disease with presumed immunity	CE	PHVS - History of Disease as Evidence of Immunity (IIS)	History of disease as evidence of immunity
75505-8	Disease with serological evidence of immunity	CE	PHVS - Serological Evidence of Immunity (IIS)	Serological evidence of immunity
30979-9	Vaccine due next	CE	HL70292 – CVX Codes	Recommended vaccine
30980-7	Recommended Date vaccine due	DT	20120816	Recommended date due
30981-5	Earliest date to give	DT	20120730	This value represents the earliest possible date the next dose could be given
59777-3	Latest date to give	DT	20120830	This value represents the latest possible date the next dose could be given

59778-1	Overdue date	DT	20120830	This value represents the date when the next dose is considered overdue
30956-7	Vaccine Type	CWE	CVX	This value represents the vaccine type recommended
59783-1	Vaccine Group Recommendation Status	CE	LN	Vaccine group is not recommended (or conditionally recommended) and why

PHVS – History of Disease as Evidence of Immunity

The CIR HL7 Web Service currently accepts only history of varicella as evidence of immunity (PHVS_HistoryOfDiseaseAsEvidenceOfImmunity_IIS code 38907003).

Concept Code	Concept Name	Concept Description
38907003	Varicella (disorder)	History of Varicella infection

PHVS – Immunization Funding Source

The CIR HL7 Web Service currently accepts funding source.

Code	Label	Definition
PHC70	Private	vaccine stock used was privately funded
VXC50	Public	vaccine stock used was publicly funded
VXC51	Public VFC	vaccine stock used was publicly funded by VFC program
VXC52	Public Non-VFC	vaccine stock used was publicly funded b VFC program

User Defined Table 0534 - Priority Group

The CIR HL7 Web Service currently accepts both SOC and NYSIIS codes for priority group.

Priority group values below are as of 01/14/2021. **New Priority Categories will be added during the vaccination campaign.**

Visit page: https://www1.nyc.gov/site/doh/covid/covid-19-vaccine-eligibility.page **for updates.**

Priority Group Code (SOC Codes)	**Priority Group Description**
W29-1	Health Care/Hospital Staff
G1	Long-term care facility residents
W29-2	Long-Term Care Health Care Staff
W29-4	Hospital Care Provider - Emergency Medical Staff
W39-4	Medical examiners and coroners
W39-5	Funeral workers-direct contact -infectious material/bodily fluids
W29-3	Health care provider staff (worker), Other
W29-5	Heath Care Provider Ambulatory
W33	First Responders (fire, police)
W39-1	Childcare workers
W25	Teachers and Staff
W45	Food and Agriculture
W53-1	Public Transit
W33-1	Corrections Workers
W35-1	Grocery Workers
W51-3	Manufacturing Workers
W43-5	U.S. Postal Workers
G3	Age 75 years and older
G7	Experiencing homelessness/living in shelters
W31	Public Health Workers
W21-1	Shelter and Housing Workers
W35	Food Service Workers
W53-2	Taxi/Car Service
W51-2	Water and Wastewater Workers
W51-1	Energy Workers
W49	Communications
W47-2	Construction
W15	IT
W23	Legal Workers
W47	Public Safety Works
W27-2	News Media
W53-3	Trucking
W13-1	Finance Workers

G3-2	Age 65 – 74 years old
G2	Persons aged 16–64 years with high-risk medical conditions
G10	Living and working in other congregate settings
G6	Incarcerated/detained in correctional facilities
G4	From racial and ethnic minority groups
G8	Attending colleges/universities
G12	With disabilities
G13	Under- or uninsured
W17	Architecture and Engineering Occupations
W37	Building and Grounds Cleaning and Maintenance Occupations
W21-4	Clergy
W13-2	e-commerce
W27-1	Entertainment and Media Workers
W41-3	Financial Institution
W19	Life, Physical, and Social Science Occupation
W11-1	Management Occupations
W55	Military
W43	Office and Administrative Support Occupations
W39-2	Personal Care (Salon, gym, nail)
W41-2	Real Estate
W39-3	Recreation
W41-1	Retail
W21-2	Social Services
G99	General Public

Priority Group Code (NYSIIS Codes)	**Priority Group Description**
HCPHOSP	HealthCare providers Hospital staff
LTCFRES	Long term care facility residents
LTCFHCP	LongTermCare Health Care providers
HCPEMS	HCP EMS
HCPME	HCP - medical examiner, coroners, morticians
HCPOTHER	Health care provider – other
HCPAMB	HCP ambulatory
75+	Those 75 years of age and older not in LTCF
PubSaf	Frontline - fire police corrections
FRONTLINE	Frontline essential workers (food/ agricultural, USPS, manufacturing, grocery, public transit, educational (teachers, support staff, and daycare workers.)
65-74	Those between 65-74 who are not in LTCF

U65HEALTH	Those under 65 years of age with underlying health conditions at high risk of hospitalization
OTHESSENTIAL	Other essential workers (transportation and logistics, food service, housing construction and finance)
RESCONG	Residents in congregate settings other than LTCF or NH (eg., shelters, group homes, treatment facility, behavioral health facility, correctional facility)
PREGNANT	People who are currently pregnant
AGE	Eligible age at time of visit per current NYS guidelines
3HEALTH	3rd dose administered due to existing health condition (immunocompromised)

User Defined Table 0535 – Gender Identity

Value	Description	Definition	Constraints
W	Woman	Person identifies as woman	Allowed in VXU and QBP messages
M	Man	Person identifies as man	Allowed in VXU and QBP messages
TW	Transgender woman (MTF)	Person identifies as transgender woman (MTF)	Allowed in VXU and QBP messages
TM	Transgender man (FTM)	Person identifies as transgender man (FTM)	Allowed in VXU and QBP messages
NB	Non-binary person	Person identifies as non-binary	Allowed in VXU and QBP messages
GQ	Genderqueer person	Person identifies as genderqueer	Allowed in VXU and QBP messages
OTH	A gender identity not listed above	Person identifies as gender identity not listed above	Allowed in VXU and QBP messages
UNK	Unknown	Unknown	Allowed in VXU and QBP messages
PNTA	Prefer Not to Answer	Person prefers not to answer	Allowed in VXU and QBP messages

User Defined Table 0535(2) – Sexual Orientation

Value	Description	USCDI/Snomed	Constraints
38628009	Gay or Lesbian	38628009	Allowed in VXU and QBP messages
20430005	Straight or heterosexual	20430005	Allowed in VXU and QBP messages
42035005	Bisexual	42035005	Allowed in VXU and QBP messages
QUR	Queer	QUR	Allowed in VXU and QBP messages
QNS	Questioning or not sure	QNS	Allowed in VXU and QBP messages
OTH	A sexual orientation not listed here	OTH	Allowed in VXU and QBP messages
UNK	Unknown	UNK	Allowed in VXU and QBP messages
PNTA	Declines to Answer	ASKU	Allowed in VXU and QBP messages

HL7 and User Defined Table 0536 – Race Codes

US Race Codes	Description
1002-5	American Indian or Alaska Native
2028-9	Asian
2076-8	Native Hawaiian or Other Pacific Islander
2054-5	Black or African-American
2106-3	White
2131-1	Other Race
<empty field>	CIR will store as “Not Indicated” and return non-fatal error
PHC1175	Refused to Answer
ASKU	Asked but No Answer
CIR Race Codes* *CIR codes are used for values below due to corresponding CDC Race and Ethnicity Codes being not yet available	Description
UNK	Unknown / Undetermined
TOMR	Two or More Races
PNTA	Prefer Not to Answer

User Defined Table 0537 – CIR Invalid Dose Reasons

OBX-3 Value	OBX-5 Value	CIR Invalid Dose Reasons
	1001	The age of this patient was below the recommended minimum age of the vaccine.
	1002	This immunization event occurred prior to the recommended age or recommended interval for this dose.
	1003	This immunization event occurred prior to the recommended age or recommended interval for this dose.
	1004	This immunization event occurred prior to the recommended age or recommended interval for this dose.
	1005	This immunization was administered below the minimum age for this dose.
	1006	The current immunization schedule does not support this vaccine, series and dose number combination.
	1007	This immunization was administered above the recommended age for this series.
	1008	The system only evaluates events which were administered when the patient was under 8 years old.
	1009	This immunization event was an extra dose since it occurred after this series was completed.
	1010	The system was unable to produce a recommendation based on the immunization history of this patient.
	1011	The system was unable to process this event due to the structure of the curr immunization schedule.
	1012	This imm. occurred prior to the min recommended interval for admin. of another live virus vaccine.
	1013	This vaccine series is not applicable based on the date of birth of this patient.
	1014	This immunization was administered outside of the influenza season.
	1015	The vaccine has already been given as many times as allowed during this season.
	1016	This vaccine is not currently licensed for this age.
	1017	This vaccine is currently licensed only for use in females.
	1018	Before Vaccine Min Age.
	1019	Past Vaccine Max Age.
	1020	DTaP-Hib not accepted unless final dose in series, and other rules are followed.
	1021	Event rejected, Tdap previously accepted.
	1022	This vaccine is licensed for a single dose only.
	1023	Only one LAIV can be given at a time.
	1024	The imm. event occurred less than the minimum days after the administration of another vaccine.
	1025	Extra Dose. Contains no needed antigens.
	1029	OPV invalid after 4/2016; vaccine does not contain all 3 strains.
	1031	Vaccine not currently evaluated by CIR.
	1085	This vaccine contained insufficient antigen for the patient's age.
	1086	This immunization event was recorded prior to the date of birth.
	1088	This patient was below the minimum age for this dose.
	1089	Extra dose.
	1090	Waiting for evaluation.
	1091	Accepted but unevaluated.
	1092	Immunity documented.
	1105	Disease documented.
	1106	Above recommended age.
30982-3	1107	This immunization event occurred prior to the specified minimum interval for a live virus dose.

	1108	Invalid as a primary shot; valid only as a booster dose.
	1109	The vaccine is not allowed for this dose.
	1110	The timing of the administration of this shot does not follow the guidelines of the EUA regarding the minimum age and/or minimum interval.
	1111	The shot was a duplicate given on the same day.
	1112	The vaccine is not counted based on the most recent vaccine given.
	1113	Vaccine is not approved for use in the U.S.
	1114	Vaccine is not approved for use in the U.S. or by WHO
	1115	This immunization was administered below the minimum interval for this dose.
	1119	This immunization was administered above the maximum age for this vaccine.
	1121	Vaccine not part of this series
	1122	The diphtheria and tetanus components are invalid due to minimum interval violation, pertussis component valid.
	1123	This immunization was administered below the minimum age for the final dose.
	1124	This immunization was administered below the minimum interval for this dose.
	1125	This immunization contains insufficient antigen for the patient age.
	1126	OPV invalid on or after 4/1/2016
	1127	The vaccine administered is outside of the routine series.
	1128	This vaccine was not yet licensed.
	2000	This immunization event occurred prior to the specified minimum interval for this dose. The dose does not need to be repeated unless the patient is severely immunosuppressed.
	2001	The timing of the administration of this shot does not follow the guidelines regarding the minimum age.
	2002	The timing of the administration of this shot does not follow the guidelines regarding the minimum interval of 4 months required for the 2nd Booster Dose.
	2003	The timing of the administration of this shot does not follow the guidelines regarding the minimum interval of 8 weeks required for the 1st Booster Dose.
	2004	The timing of the administration of this shot does not follow the guidelines regarding the minimum interval of 5 months required for the 1st Booster Dose.
	2005	The timing of the administration of this shot does not follow the guidelines regarding the minimum interval of 8 weeks required for the 2nd Booster Dose.
	2006	Pertussis is needed to complete the series
	2007	DT should only be administered to children 6 weeks through 6 years of age with a contraindication to pertussis vaccine
	2008	The timing of the administration of this shot does not follow the guidelines regarding the minimum interval of 8 weeks.
	2009	The timing of the administration of this shot does not follow the guidelines regarding the minimum interval of 4 months.
	3009	This immunization event was an extra dose since it occurred after this series was completed.

Appendix B: Example Messages

VXU and ACK Response Messages

VXU – Add Immunization and Evidence of Immunity Observation

Storyboard

Mom (Rebecca Mason, maiden name Walters) brings her son, Matthew Thomas Mason (male, born 10/15/2012), to the Queens Clinic. The family, including Matt's dad (Tom Mason), twin sister (Margaret), and older sister (Melinda), lives at 305 Big Apple Blvd, Apartment 7C, New York, New York, 12345-1234. Rebecca lets the clinic know that she can be contacted on her mobile phone, (927) 555-1313, or by email at rebecca.mason@isp.com.

Matt had one historical dose of Hep-B on 10/26/2012, according to the written record brought in by his mom. Rebecca also brought documentation that Matt was diagnosed with Varicella on 12/1/2017 and has serology confirmed immunity to mumps, measles, and rubella as of 03/15/2020.

Queens Clinic administers two shots to Matt on 02/23/2021, ordered by Lisa Jones (NPI number 123456789):

- IPV (CVX 10), lot number W2348796456, expiration date 7/31/2021, manufacturer Merck (This dose was given on the left arm.)
- Influenza Intranasal (CVX 111), lot number ABC1234567, expiration date 6/30/2021, manufacturer Merck (This dose was given on the right arm.)

Matt has Medicaid and is eligible for a VFC lot for both administered vaccines.

The CIR has assigned Queens Clinic a facility identifier of "8000N70". Queens Clinic is using version 3.1 of the electronic medical record (EMR) application "Patients First". The NYC DOHMH requires that Queens Clinic send client and immunization information to the CIR to help ensure that their patients' immunization records are kept up-to-date.

Queens Clinic reports Matt's immunizations to the CIR using a 2.5.1 HL7 VXU message and includes the following:

- The Clinic includes Matt's local registry/CIR ID (788408952), his Queens Clinic medical record number (M882894), and his Medicaid number (MC12345M) as patient identifiers.
- The Clinic also indicates that Matt was part of a multiple birth and reports a birth order of "2".
- For the historical dose of Hep B given on 10/26/2015, Queens Clinic does not know the location where this vaccine was administered to Matt; however, since the Administered at Location is always required (even for historical immunizations), Queens Clinic will value the Administered at Location (RXA-11) with their facility ID (8000N70) for all three immunizations being reported.
- The clinic reports Matt's history of varicella disease as presumed immunity and serological evidence of immunity to MMR.
- Since Queens Clinic is also submitting the message, they will also value the Sending Facility (MSH-4) with their 8000N70 facility code.
- Queens Clinic is also the business organization that originated and is accountable for the message, so they will also value the Sending Responsible Organization (MSH-22) with their 8000N70 facility code.

- The Queens Clinic EMR system sends two OBX segments for administered doses: the vaccine funding program eligibility category and the vaccine funding source. These may be used for decrementing inventory in the CIR Vaccine Inventory Management module.

Message

MSH|^~\&|Patients First 3.1|8000N70| NYC DOHMH | NYC DOHMH |20210223093122-0500||VXU^V04^VXU_V04|587999438218|T|2.5.1|||NE|AL|||||8000N70|

PID|1||788408952^^^^LR~M882894^^^8000N70^MR~MC12345M^^^^MA||Mason^Matthew^Thomas^^^^L~^Matt^^^^^A|Walters^Rebecca^^^^^M|20151015|M||2106-3^White^HL70005|305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345-1234^^P||^PRN^CP^^^927^5551313||ENG^English^HL70296|||||||N^Not Hispanic or Latino^HL70189|11116|Y|2|

NK1|1|Mason^Rebecca^Ann^^^^L|MTH^Mother^HL70063||^PRN^PH^^^212^5551212~^ORN^CP^^^927^5551313~^NET^X.400^Rebecca.Mason@isp.com|^WPN^PH^^^212^7771212^497|||||||||19781115|

NK1|2|Mason^Tom^^^^^L|FTH^Father^HL70063||^PRN^PH^^^212^5551212~^ORN^CP^^^927^5551414~^NET^X.400^Tom.Mason@isp.com|^WPN^PH^^^212^3456789^101|||||||||19750725|

ORC|RE||98723649^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20151026||08^HEP B^CVX|999|||03^Historical Immunization Record^NIP001||^^^8000N70|||| |||||CP|A|

ORC|RE||234807236^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20210223||10^IPV^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70||||W2348796456|20210731|MSD^Merck^MVX|||CP|A|

RXR|C28161^Intramuscular^NCIT|LA^Left Arm^HL70163

OBX|1|CE|64994-7^vaccine fund pgm elig cat^LN|1|V02^VFC eligible-Medicaid^HL70064|||||F|||20210223|

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064|||||F|||20210223|

ORC|RE||354843239^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20210223||111^Influenza Intranasal^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70||||ABC1234567|20160630|MSD^Merck^MVX|||CP|A|

RXR|C28161^Intramuscular^NCIT|RA^Right Arm^HL70163**OBX**|1|CE|64994-7^vaccine fund pgm elig cat^LN|1|V02^VFC eligible-Medicaid^HL70064|||||F|||20210223|

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064|||||F|||20210223|

ORC|RE||9999^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20171011||998^No vaccine administered^CVX|999|||||^^^8000N70|||||||NA|A|

OBX|1|CE|59784-9^Disease with presumed immunity^LN |1|38907003^HISTORY OF VARICELLA INFECTION^SCT|||||F|||20171201|

ORC|RE||9999^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20200223||998^no vaccine administered^CVX|999|||||^^^8000N70|||||||NA|A|

OBX|1|CE|75505-8^Disease with presumed immunity^LN|1|371112003^Serology confirmed mumps^SCT|||||F|||20150315|

ORC|RE||9999^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20200223||998^no vaccine administered^CVX|999|||||^^^8000N70|||||||NA|A|

OBX|1|CE|75505-8^Disease with presumed immunity^LN|1|371111005^Serology confirmed measles^SCT|||||F|||20150315|

ORC|RE||9999^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20200223||998^no vaccine administered^CVX|999|||||^^^8000N70|||||||NA|A|

OBX|1|CE|75505-8^Disease with presumed immunity^LN|1|278968001^Serology confirmed rubella^SCT|||||F|||20150315|

ACK – Response to a VXU containing No Errors

Storyboard

An ACK response message is returned with an MSA-1 value of “AA” when a VXU containing no errors is received and processed by the CIR HL7 Web Service.

When returning an ACK in response to a successful VXU, the CIR HL7 Web Service will return the patient’s CIR ID in MSH-10. The format will be the message identifier followed by a colon and then the CIR ID (e.g., **788408952**).

> The HL7 Data Exchange Partner’s system should store the CIR ID with the patient record and include that CIR ID (i.e., Local Registry ID) in future VXU and QBP messages to decrease the time that it takes for the web service to process the messages and respond.
>
> The CIR HL7 Web Service will always send the most current CIR ID in the ACK response message; therefore, the CIR ID returned by the CIR HL7 Web Service within the ACK may be different from the CIR ID that the HL7 Data Exchange Partner submitted in the VXU message. The HL7 Data Exchange Partner’s system should replace its existing CIR ID reference with the new CIR ID that was communicated within the ACK message.

Message

MSH|^~\&|CIR HL7 WS 2.01 PROD |NYC DOHMH|Patients First 3.1|8000N70|20210223102509-0500||ACK^V04^ACK|20210223102509-0500CIR-WS:**788408952**|T|2.5.1|||NE|NE|

MSA|AA|587999438218|

ACK – Response to a VXU containing Non-Fatal Errors

Storyboard

Queens Clinic submits a 2.5.1 VXU to the CIR HL7 Web Service that contains the following non-fatal errors:

- The patient's primary language is English. PID-15.1 should be valued with the code "eng"; however, it is valued with "en" which is no longer a valid value in HL7 table 0357.
- Of the three submitted patient identifiers, the second identifier is missing an Identifier Type (PID-3.5).
- The mom's date of birth (NK1-16 in the first NK1 segment) is not a valid date.
- The area code of the father's business phone (NK1-6.6 in the 2nd NK1 segment) contains too many digits.
- In the 2nd RXA the name of the manufacturer is provided (RXA-16.2 text field); however, the manufacturer code (MVX code in RXA-16.1) is missing.
- In the 3rd ORC the Provider ID Number (ORC-12.1) is 8 digits when the Identifier Type Code (ORC-12.13) is "NPI"

> In this example, the Provider License Number is neither 6 digits (the expected format for a license number) nor 10 digits (the expected format for a NPI number).
>
> Since the error in ORC-12.1 (ID Number) has the potential for causing the message and/or the RXA segment to be rejected, two error segments are generated for this error: one indicating the bad format and the second indicating that, (since the license number was not the correct format and could not be absorbed by the CIR database), the Provider ID is considered missing. If ORC-12 is not valued or if ORC-12 is valued but contains errors, then the Ordering Provider will be disregarded and the immunization will be associated with the default provider of the facility reported in RXA-11.4.1.
>
> Generally, the CIR will maintain a default provider for every facility; however, if a default provider has not been established for a facility, the error will be considered fatal and the RXA segment rejected.
>
> In our example, CIR has established a default provider for Queens Clinic, so this error is non-fatal.

Fields containing non-fatal errors cannot be used for matching nor can the data be absorbed by the CIR database.

The VXU does not contain any fatal errors.

When a VXU containing only non-fatal errors is received and processed by the CIR HL7 Web Service, an ACK response message is returned with an MSA-1 value of "AE". The ACK will contain an ERR segment for each non-fatal error. The ERR segment provides information about the error, such as the error location and the type of error. ERR-4 (Error Severity) will have a value of "W" for "Warning" when the error is non-fatal.

ERR-2 (Error Location) will be formatted as follows:

- The 1st component contains the Segment ID
- The 2nd component contains the Segment Sequence
- The 3rd component contains the Field Position
- The 4th component contains the Field Repetition
- The 5th component contains the Component Number

*So, if PID-3 was valued with "*CC88888C^^^^MA~123456789^^^^~A123456789^^^^MC"*, then ERR-2 would be valued as follows to indicate the error is in the 2nd repetition of the PID-3.5 field within the 1st (only) PID segment:* ERR||**PID^1^3^2^5**|

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 3.1|8000N70|20191207110403-0500||ACK^V04^ACK|20121207110403-0500CIR-WS:777815087|T|2.5.1|||NE|NE|

MSA|AE|789034438218|

ERR||PID^1^15^1^1|103^Table value not found^HL70357|W|TableValueNotFound^^HL70357|||Language: TableValueNotFound|

ERR||PID^1^3^2^5|102^Data type error^HL70357|W|ValueMissing^^HL70357|||Identifier_Type: ValueMissing|

ERR||NK1^1^16^1^1|102^Data type error^HL70357|W|BadDateTime^^HL70357|||Mother_DOB: BadDateTime|

ERR||NK1^2^6^1^6|102^Data type error^HL70357|W|ValueExceedMaxLen^^HL70357|||Father_Bus_AreaCode: ValueExceedMaxLen|

ERR||RXA^2^17^1^1|102^Data type error^HL70357|W|ValueMissing^^HL70357|||Vaccine_Lot_Manufacturer: ValueMissing|

ERR||ORC^3^12^1^1|102^Data type error^HL70357|W|BadFormat^^HL70357|||Provider_Id: BadFormat|

ERR||ORC^3^12^1^1|102^Data type error^HL70357|W|ValueMissing^^HL70357|||Provider_Id: ValueMissing|

ACK – Response to a VXU containing Fatal Errors

Storyboard

Queens Clinic submits a 2.5.1 VXU to the CIR HL7 Web Service that contains the following fatal errors:

- The Sending Facility value (MSH-4) does not match the CIR issued facility code of the facility that is sending the message.
- Message Date/Time (MSH-7) does not include the time zone, which is required for a 2.5.1 message.
- Patient Administrative Sex (PID-8) was not valued. This is not a required field, but the CIR will return a non-fatal warning.
- Patient Identifier List (PID-3) was not valued; this is a required field in a 2.5.1 VXU.
- The 2nd RXA is missing an Administered-at Location (RXA-11). While this field has a usage of RE in the CDC IG, this field is required by the CIR HL7 Web Service. RXA-11 must be valued with a valid CIR issued facility code.

When a VXU containing fatal errors is received and processed by the CIR HL7 Web Service, an ACK response message is returned with an MSA-1 value of “AR”. The ACK will contain an ERR segment for each fatal error (and any non-fatal errors, if they exist). The ERR segment provides information about the error, such as the error location and the type of error. ERR-4 (Error Severity) will have a value of “E” for “Error” when the error is fatal.

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 1.1|5555R55|20121207114053-0500||ACK^V04^ACK|20121207114053-0500CIR-WS|T|2.5.1|||NE|NE|

MSA|AR|789034438218|

ERR||MSH^1^4^1^1|103^Table value not found^HL70357|E|Mismatch^^HL70357|||Sending_Facility: Mismatch|

ERR||MSH^1^4^1^1|101^Required field missing^HL70357|E|RequiredField^^HL70357|||Sending_Facility: RequiredField|

ERR||PID^1^3^1|101^Required field missing^HL70357|E|RequiredField^^HL70357|||Patient_Id_List_Identifier_Type: RequiredField|

ERR||RXA^2^11^1^4^1|101^Required field missing^HL70357|E|RequiredField^^HL70357|||Immunization_FacilityCode: RequiredField|

ERR||MSH^1^7^1^1|101^Required field missing^HL70357|E|RequiredField^^HL70357|||Message_Datetime: RequiredField|

ERR||MSH^1^7^1^1|102^Data type error^HL70357|W|BadDateTime^^HL70357|||Message_Datetime: BadDateTime|

ERR||PID^1^8^1|101^Required field missing^HL70357|W|RequiredField^^HL70357|||Patient_Sex: ValueMissing|

VXU – Adult Patient with Protection Indicator

Storyboard

Rebecca Mason, maiden name Walters, arrives at the Queens Clinic. The family, including Rebecca's husband (Tom Mason), twins (Matthew Thomas Mason & Margaret Mason), and older daughter (Melinda), lives at 305 Big Apple Blvd, Apartment 7C, New York, New York, 12345-1234. During her son's visit to Queens Clinic, Rebecca has already let the clinic know that she can be contacted on her mobile phone, (927) 555-1313, or by email at rebecca.mason@isp.com.

Rebecca brought documentation of a historical Hep-B dose that she received on Dec 2, 1978. Since Rebecca and her family moved to New York City from outside New York state, her patient record is does not already exist in the CIR. Also, since Rebecca is an adult (19 years of age or older) born on 11/15/1978, she must consent in order to have her information reported to the CIR. She provides consent and this is recorded in the Queen's Clinic EMR system and subsequently reported in the VXU message sent by the clinic to the CIR.

Queens Clinic administers three shots to Rebecca on 10/15/2021, ordered by Lisa Jones (NPI number 123456789):

- Tdap (CVX 115), lot number EFG6777, expiration date 9/30/2022, manufacturer GlaxoSmithKline, administered by intramuscular route in the right deltoid
- Influenza-IIV4 (CVX 158), lot number EEE4444, expiration date 6/30/2022, manufacturer GlaxoSmithKline, administered by intramuscular route in the right deltoid
- COVID-19 (CVX 207), lot number 024A22A, expiration date 8/12/2022, manufacturer Moderna, administered by intramuscular route on the left arm

Rebecca is currently not insured and is eligible for publicly funded vaccine.

The CIR has assigned Queens Clinic a facility identifier of "8000N70". Queens Clinic is using version 1.1 of the electronic medical record (EMR) application "Patients First". The NYC DOHMH requires that Queens Clinic send client and immunization information to the CIR to help ensure that their patients' immunization records are kept up-to-date.

Queens Clinic reports Rebecca's immunizations to the CIR using a 2.5.1 HL7 VXU message and includes the following:

- The Clinic includes her Queens Clinic medical record number (Mason332392), as a patient identifier.
- When Queens Clinic entered the immunizations in their EMR they assigned a unique immunization ID to each record; those unique IDs are included for each immunization reported: 77845536 (HepB), 98426639 (Tdap), 299808336 (Influenza), 123544452 (COVID-19).
- For the historical dose of Hep B given on 06/02/2000, Queens Clinic does not know the location where this vaccine was administered to Rebecca; however, since the Administered at Location is always required (even for historical immunizations), Queens Clinic will value the Administered at Location (RXA-11) with their facility ID (8000N70) for all three immunizations being reported.
- Since Queens Clinic is also submitting the message, they will also value the Sending Facility (MSH-4) with their 8000N70 facility code.
- Queens Clinic is also the business organization that originated and is accountable for the message, so they will also value the Sending Responsible Organization (MSH-22) with their 8000N70 facility code.
- The PD1 segment is sent in the VXU and PD1-12 is valued "N" indicating the patient's data may be shared; and PD1-13 is valued with an acceptable date value.

Message

MSH|^~\&|Patients First 1.1|8000N70| NYC DOHMH | NYC DOHMH |20211016093122-0500||VXU^V04^VXU_V04|587333433244|T|2.5.1|||NE|AL||||||8000N70|

PID|1||Mason332392^^^8000N70^MR||Mason^Rebecca^^^^^L~^Becca^^^^^A|Walters^Julie^^^^^M|19781115|F||2106-3^White^HL70005|305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345-1234^^P||^PRN^CP^^^927^5551313||ENG^English^HL70296|||||||N^Not Hispanic or Latino^HL70189||||

PD1||||||||||||N|20170416|

ORC|RE||77845536^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|19781202||08^HEP B^CVX|999|||03^Historical Immunization Record^NIP001||^^^8000N70|||||||CP|A|

ORC|RE||98426639^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20211015||115^Tdap^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70|||| EFG6777|20220930|SKB^GlaxoSmithKline^MVX|||CP|A|

RXR|C28161^^NCIT^IM^^HL70162|RD^Right Deltoid^HL70163

OBX|1|CE|64994-7^vaccine fund pgm elig cat^LN|1|V03^VFC eligible-Uninsured^HL70064||||||F|||20170415

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064||||||F|||20170415

ORC|RE||299808336^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20211015||158^Influenza ^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70|||| EEE4444|20220630|SKB^GlaxoSmithKline^MVX|||CP|A|

RXR|C28161^^NCIT^IM^^HL70162|RD^Right Deltoid^HL70163

OBX|1|CE|64994-7^vaccine fund pgm elig cat^LN|1|V03^VFC eligible-Uninsured^HL70064||||||F|||20170415

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064||||||F|||20170415

ORC|RE||123544452^QueensClinic||||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20211015||207^ ^COVID-19, mRNA, LNP-S, PF, 100 mcg/ 0.5 mL dose^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70|||| 024A22A |20220812|MOD^Moderna^MVX|||CP|A|

RXR|C28161^^NCIT^IM^^HL70162|LA^Left Arm^HL70163

OBX|1|CE|64994-7^vaccine fund pgm elig cat^LN|1|V03^VFC eligible-Uninsured^HL70064||||||F|||20170415

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064||||||F|||20170415

VXU – Delete and Update (Delete + Add)

Storyboard

Rebecca Mason returns to Queens Clinic with her twins Matt and Margaret (born 10/15/2012). Queens Clinic, before treating the twins, sends a QBP to the CIR HL7 Web Service for each child to obtain their up-to-date immunization information.

After reviewing each child's record, the Clinic realizes that two mistakes have been made on Matt's record:

- The Clinic previously reported that both Matt and Margaret had received Varicella vaccines (CVX 21) on 1/3/2015; however, only Margaret received the Varicella shot that day. The 1/3/2015 shot of Varicella (CVX 21) needs to be deleted from Matt's record.
- The Clinic previously reported that a MMR vaccine (CVX 03) was given to Matt on 3/1/2015; however, Queens Clinic actually administered the MMR shot to Matt on 1/3/2015. The 3/1/2015 shot of MMR (CVX 03) needs to be deleted from Matt's record and a 1/3/2015 shot of MMR added.

Queens Clinic submits a 2.5.1 VXU message to the CIR HL7 Web Service to correct Matt's record.

The first RXA segment in the VXU requests that the 1/3/2015 dose of Varicella (CVX 21) be deleted from Matt's record (RXA-21 action code of "D"). Since this shot was originally reported by Queens Clinic, when the request is received, the CIR HL7 Web Service looks for and finds the matching immunization record previously reported by the Clinic and deletes the Varicella shot from Matt's record in the CIR database.

The second and third RXA segments work together to update Matt's record. The second RXA segment, with "D" (for Delete) in RXA-21, requests that the MMR (CVX 03) reported as administered on 3/1/2015 be deleted. The third RXA segment, with "A" (for Add) in RXA-21, requests that an MMR be added with an administration date of 1/3/2015. When the CIR HL7 Web Service receives this request, it will delete the 3/1/2015 MMR and add a 1/3/2015 MMR to Matt's record in the CIR database, effectively performing an update.

Message

MSH|^~\&|Patients First 1.1|8000N70| NYC DOHMH | NYC DOHMH |20160223153122-0500||VXU^V04^VXU_V04|2398472087564|T|2.5.1|||NE|AL|||||8000N70|

PID|1||788408952^^^^LR~Mason2213456978^^^8000N70^MR~MM12345M^^^^MA||Mason^Matthew^Thomas^^^^L~^Matt^^^^^A|Walters^Rebecca^^^^^M|20081015|M||2106-3^White^HL70005|305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345-1234^^P||^PRN^PH^^^212^5551212||ENG^English^HL70296|||||||N^Not Hispanic or Latino^HL70189|11116|Y|2|

ORC|RE||987286499^QueensClinic|||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXR|C28161^^NCIT^IM^^HL70162|LA^Left Arm^HL70163

RXA|0|1|20150103||21^Varicella^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70|||| |||||CP|D

ORC|RE||987286524^QueensClinic|||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXR|C28161^^NCIT^IM^^HL70162|LA^Left Arm^HL70163

RXA|0|1|20150301||03^MMR^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70||||W2348796456|20130731|MSD^Merck^MVX|||CP|D|

OBX|1|CE|64994-7^ vaccine fund pgm elig cat^LN|1|V02^VFC eligible-Medicaid^HL70064|||||F||||

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064|||||F|||20150301

ORC|RE||987286524^QueensClinic|||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXR|C28161^^NCIT^IM^^HL70162|LA^Left Arm^HL70163

RXA|0|1|20150103||03^MMR^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70||||W2348796456|20130731|MSD^Merck^MVX|||CP|A|

OBX|1|CE|64994-7^ vaccine fund pgm elig cat^LN|1|V02^VFC eligible-Medicaid^HL70064||||||F||||

OBX|1|CE|30963-3 ^vaccine funding source^LN|1|VXC50^Public^HL70064||||||F|||2015010

VXU/ACK – Generic Patient First Name (Newborn Hepatitis B Vaccination)

Storyboard: *Add immunization, with Generic Patient First Name*

A baby boy is born at Queens General Hospital on 05/04/2020. A patient record is created for the baby with generic first name of "BABY BOY." The newborn's name will be registered with Vital Records later as Jonathan Snow.

Queens General Hospital administers a Hepatitis B vaccination to the newborn 24 hours after the patient is born:

- Hepatitis B, adolescent or pediatric (CVX 08), lot number ABC1234567, expiration date 06/30/2021, manufacturer Merck

The CIR has assigned Queens General Hospital a facility identifier of "8000N70". Queens General Hospital is using versions 1.1 of the electronic medical record (EMR) application "Patients First". The NYC DOHMH requires that Queens General Hospital send client and immunization information to the CIR to help ensure that their patients' immunization records are kept up-to-date.

Queens General Hospital reports the baby's immunizations to CIR using a 2.5.1 HL7 VXU message and includes the following:

- The Hospital includes BABY BOY's medical record number (22222). No local registry/CIR ID has been assigned to BABY BOY at this time.
- When Queens General Hospital entered the immunizations in their EMR they assigned a unique immunization ID to each record; those unique IDs are included for each immunization reported: 98723649 (Hep-B)
- Since Queens General Hospital is also submitting the message, they will also value the Sending Facility (MSH-4) with their 0000I01 facility code.
- Queens General Hospital is also the business organization that originated and is accountable for the message, so they will also value the Sending Responsible Organization (MSH-22) with their 0000I01 facility code.

Message

MSH|^~\&| Patients First 1.1 t|8000N70| NYC DOHMH | NYC DOHMH |20200505090000-0500||VXU^V04^VXU_V04|803530513782|T|2.5.1|||NE|AL|||||0000I01|

PID|1||22222^^^8000N70 ^MR||Snow^Baby Boy^^^^^~^^^^^^A|Snow^Jane^^^^^M|20200504|M||2106-3^White^HL70005|305 Big Apple Blvd Big Apple Blvd 305^7C^New York^NY^12345-1234^^P||^PRN^CP^^^927^5551313||ENG^English^HL70296|||||||N^Not Hispanic or Latino^HL70189|11116|N||

ORC|RE||354843239^QueensGeneralHospital|||||||1234567890^Jones^Lisa^^^^^^CMS^^^^NPI|

RXA|0|1|20200505||08^Hep B, adolescent or pediatric^CVX|999|||00^New Immunization Record^NIP001||^^^8000N70||||ABC1234567|20210630|MSD^Merck^MVX|||CP|A|

OBX|1|CE|64994-7^vaccine fund pgm elig cat^LN|1|V02^VFC eligible-Medicaid^HL70064|||||F|||20191203|

OBX|1|CE|30963-3^vaccine funding source^LN|1|PHC70^Private^CDCPHINVS|||||F|||20200504|

Storyboard: *Response to message with Generic Patient First Name*

CIR returns receives the VXU from Queens General Hospital and evaluates whether the message should be rejected due to a generic patient first name. The CIR HL7 Web Service checks the following criteria for rejection:

- Patient first name is a generic (e.g., BABY, BABY BOY – CIR maintains list of generic first names)
- Number of administered immunizations is less than 3
- For each administered immunization, time between date of administration and date of birth is less than 24 days and greater than or equal to 0 days

Because the VXU meets all the criteria above, the CIR HL7 Web Service rejects the message and returns an ACK response with an MSA-1 value of "AR." In the ERR segment, the HL7 Web Service returns an error code indicating the message was rejected due to a generic patient first name.

CIR also stores the rejected VXU for later re-processing.

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 1.1|5555R55|20200505090100-0500||ACK^V04^ACK|20200505090100-0500CIR-WS|T|2.5.1|||NE|NE|

MSA|AR|789034438218|

ERR||PID^1^5^1^2|207^Application internal error^HL70357|E|GenericPatientFirstName^^HL70357|||Patient_First_Name: GenericPatientFirstName|

Storyboard: *Re-processing of VXU with Generic Patient First Name*

Three weeks later, CIR receives a VXU from Vital Records for the newborn Jonathan Snow and creates a patient record for Jonathan in the immunization registry.

Once a week, the CIR re-processes messages <=8 weeks old that rejected due to Generic Patient Frist Name. If a rejected message returns a patient match upon re-processing, the information from the generic name VXU will be merged to the existing patient record in the CIR database. No ACK response is returned to the HL7 Data Exchange Partner during re-processing.

The CIR HL7 Web Service re-processes the VXU from Queens General Hospital and finds a match against the patient record for Jonathan Snow. The CIR HL7 Web Service updates the Jonathan's immunization record with the information from the original VXU.

Storyboard: *COVID vaccination test submission*

A 55-year-old individual with undisclosed administrative sex, is non-Hispanic, and declines to specify race, is administered a publicly funded Moderna COVID-19 vaccine. The patient has both a home phone and a cell phone.

MSH|^~\&|Patients First 3.1|8000N70|NYC DOHMH|NYC DOHMH|20201116082240-0500||VXU^V04^VXU_V04| Message control id # 5126552020|P|2.5.1|||ER|AL|||||Z22^CDCPHINVS |8000N70

PID|1||M52375 ^^^ 8000N70 ^MR||Test^Adult^Covid^^^^L||19650801|U||ASKU^Asked but no answer^HL70005|320 11th

Av^^Brooklyn^NY^11220^USA^L||^PRN^PH^^^657^5558563~^PRN^CP^^^646^4085993|||||||2186-5^non Hispanic or Latino^CDCREC PD1||||||||||^^|N|20201115|||A|20201115|20201115

ORC|RE||153235^^|||||||1211506315^Smith^John^^^^^^^^^^NPI

RXA|0|1|20201115|20201115|207^COVID-19, mRNA, LNP-S, PF, 100 mcg/ 0.5 mL dose^CVX^80777-273-99^ COVID-19, mRNA, LNP-S, PF, 100 mcg/ 0.5 mL dose ^NDC|0.5|mL^MilliLiter^UCUM||00^New immunization record^NIP001|7832-1^Lemon^Mike^A^^^^^AA^^^^PRN|^^^ 8000N70||||Z0860BB|20221115|MOD^Moderna^MVX|||CP|A

RXR|C28161^Intramuscular^NCIT|LA^Left Arm^HL70163

OBX|1|CE|30963-3^VACCINE FUNDING SOURCE^LN|1|VXC50^Publicly funded vaccine stock ^CDCPHINVS||||||F|||20180315|

OBX|2|CE|64994-7^Vaccine funding program eligibility category^LN|2|V01^Not VFC Eligible^HL70064||||||F|||20200725|||VXC40^Eligibility captured AT the immunization LEVEL^CDCPHINVS

QBP and Response Messages (RSP and ACK)

QBP – Query for Patient

Storyboard

Mom (Rebecca Mason, maiden name Walters) brings her daughter, Melinda Carol Mason (female, born 10/15/2008), to the Queens Clinic on 02/23/2016. The family, including Melinda's dad (Tom Mason) and her siblings (Matt and Margaret), lives at 305 Big Apple Blvd, Apartment 7C, New York, New York, 12345-1234.

Queens Clinic wants to ensure that their immunization records for Melinda are up to date. Before treating Melinda, Queens Clinic sends a vaccine query (2.5.1 QBP message, profile Z34) to the CIR to obtain Melinda's immunization history and recommendations.

The Clinic includes Melinda's local registry/CIR ID (792133305), her Queens Clinic medical record number (MasonMel56979), and her Medicaid number (MM12345M) as patient identifiers. In addition to her name, date of birth, and sex, the Clinic also includes Melinda's address, phone number, mother's maiden name (Walters), and indicates that Melinda was not part of a multiple birth.

The CIR has assigned Queens Clinic a facility identifier of "8000N70". Queens Clinic is using version 1.1 of the electronic medical record (EMR) application "Patients First".

Message

MSH|^~\&|Patients First 1.1|8000N70|NYC DOHMH|NYC DOHMH|20160223131542-0500||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL|||||Z34^CDCPHINVS|8000N70|

QPD|Z34^Request Immunization History^HL70471|QT216987|792133305^^^^LR~MasonMel56979^^^8000N70^MR~MM54321M^^^^MA|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20081015|F|305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345-1234^^P|^PRN^PH^^^212^5551212|N|1|

RCP|I|1^RD|R|

RSP – Single Match Found, No Errors

Storyboard

When the CIR HL7 Web Service receives the QBP message from Queens Clinic for Melinda Mason, it searches for the patient and, finding a single matching patient, the CIR HL7 Web Service returns an RSP message to Queens Clinic providing the patient data that the CIR is permitted to share:

- Patient Data
    - CIR ID
    - Patient Name (First, Middle, and Last)
    - Date of Birth
    - Sex
    - Address
    - Phone number
- Immunization History
    - For each immunization on record, an RXA segment is returned that includes include the administration date, vaccine code, and vaccine description.
    - The RXA segment will also include the lot number, expiration date, and manufacturer associated with the immunization when this information is available.
    - Each RXA segment will be followed by one or more OBX segments.
        - Single vs. Multi-Component Vaccines
            - If an immunization is a multi-component vaccine, an OBX will be included for each component.
            - If the immunization is not a multi-component vaccine only one OBX segment identifying the component will follow the RXA segment.
        - Invalid Shots
            - In addition, for the 14 vaccine groups that the CIR evaluates, if any immunization component is considered **not** valid (based on the ACIP schedule) the vaccine component OBX segment will be followed by three additional OBX segments.
                - The first additional OBX segment will indicate that the component was not valid.
                - The next OBX segment will give the reason the component is invalid.
                - The final OBX segment indicates that the ACIP schedule was used to determine that the vaccine component was not valid
- Immunization Recommendations
    - Recommendation data, for the 14 vaccine groups that the CIR evaluates, will display at the end of the RSP following the immunization history.
        - There will be an ORC and an RXA segment pair for each vaccine group. The ORC segment will provide the name of the vaccine group and the RXA segment will state “no vaccine administered”.
        - The recommendation data for that vaccine group will display in multiple OBX segments following the OBX/RXA pair.
            - For recommended vaccines, these OBX segments will contain, along with other data, the recommended vaccine code and the date the next dose is recommended.
            - For vaccines not recommended or conditionally recommended or completion status, an OBX will indicate the vaccine type followed by another OBX with the reason, based on the ACIP schedule.

The RSP message also includes a QPD segment that echoes back the information exactly as it was received in the QPD segment of the query.

Note that the CIR will still return both immunization history and forecast regardless of profile request (Z34/Z44).

From the RSP message, Queens Clinic now has the following up-to-date immunization history and recommendations for Melinda Carol Mason (Female, DOB 10/15/2008, CIR ID 792133305):

Vaccine Group	History	Recommendation
Influenza	(No shots on record.)	The next influenza vaccine is due 8/1/2022.
HepB	HepB adolescent or pediatric (CVX 08) was administered on 10/26/2008, 01/05/2009, and 04/25/2009. All HepB shots were valid.	HepB is not recommended because the patient has completed this vaccine series.
Rotavirus	(No shots on record.)	Rotavirus is not recommended because the patient is more than 8 months old.
DTP	DTaP (CVX 106) was administered on 1/5/2009, 2/10/2009, and 4/25/2009; these were valid doses. DTaP/Hib (CVX 50) was administered on 4/12/2010. Another DTaP (CVX 106) was administered on 5/10/2010. This dose was invalid. This immunization event occurred prior to the recommended age or recommended interval for this dose.	A dose of Tdap (CVX 115) was due on 10/11/2015.
Hib	Hib PRP-T (CVX 48) was administered on 1/5/2010.	Hib is not recommended because the patient has completed this vaccine series.
Pneumococcal Conjugate	Pneumococcal PCV-13 (CVX 133) was administered on 1/5/2009, 1/5/2010, and 4/12/2010; these were valid doses.	Pneumococcal is not recommended because the patient has completed this vaccine series.
Polio	IPV (CVX 10) was administered on 1/5/2009, 1/5/2010, and 4/12/2010. None of the Polio shots were invalid.	The next dose of IPV (CVX 10) was due on 10/15/2012.
MMR	MMR (CVX 03) was administered on 1/5/2010 and was a valid dose.	The next dose of MMR (CVX 03) was due on 10/15/2012.
Varicella	The clinic had previously submitted a VXU message reporting that test results confirmed serological evidence of immunity to Varicella. Chickenpox was diagnosed on 7/15/2010.	Varicella is not recommended because the patient has completed the vaccine series.
Zoster	(No shots on record.)	A dose of Zoster (187) will be due 10/15/2058.
HepA	(No shots on record.)	A dose of Hep A (CVX 83) was due on 10/15/2009.
Meningococcal	(No shots on record.)	Meningococcal MCV4 (CVX 114) will be due on 10/15/2019.
HPV	(No shots on record.)	HPV (CVX 137) will be due on 10/15/2017.
Pneumococcal Polysaccharide	(No shots on record.)	Pneumococcal-polysaccharide is not currently recommended unless the patient is in a high risk group.
H1N1 Influenza	(No shots on record.)	This vaccine is no longer recommended.
COVID-19	(No shots on record.)	COVID-19 vaccine is due on 7/18/2022.

Using the information provided in the RSP, Queens Clinic will administer the following immunizations to Melinda: Influenza, MMR, IPV, Tdap, HPV and COVID-19. Once these shots are administered, Queens Clinic will submit a VXU to the CIR HL7 Web Service so that Melinda's CIR record will be kept up-to-date.

Message

MSH|^~\&|CIR HL7 WS 87d8a36|NYC DOHMH|Patients First 1.1|0000Z01|20221129023436-0500||RSP^K11^RSP_K11|20221129023436-0500CIR-WS:792133305|T|2.5.1|||NE|NE|||||Z32^CDCPHINVS|0000Z01|
MSA|AA|48077894|
QAK|QT216987|OK|Z34^Request Immunization History^CDCPHINVS|
QPD|Z34^Request Immunization History^HL70471|QT216987|792133305^^^^LR~MasonMel56979^^^8000N70^MR~MM54321M^^^^MA|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20081015|F|305 Big Apple Blvd&Big Apple Blvd&305^7C^New York^NY^12345-1234^^P|^PRN^PH^^^212^5551212|N|1|
PID|1||792133305^^^BAA^LR~MASONMEL56979^^^8000N70^MR||MASON^MELINDA^CAROL^^^^L||20081015|F|||305 BIG APPLE BLVD^7C^^NY^12345^^C||^PRN^PH^^^212^5551212|
ORC|RE||137745957^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20081026|20081026|08^Hep B LT20 yrs (Engerix, Recombivax)^CVX|999|||06^Historical information- from birth certificate^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|08^Hep B LT20 yrs (Engerix, Recombivax)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745958^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090105|20090105|08^Hep B LT20 yrs (Engerix, Recombivax)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|08^Hep B LT20 yrs (Engerix, Recombivax)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745959^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090425|20090425|08^Hep B LT20 yrs (Engerix, Recombivax)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|08^Hep B LT20 yrs (Engerix, Recombivax)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745960^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090105|20090105|106^DTaP (DAPTACEL)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP (DAPTACEL)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745961^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090210|20090210|106^DTaP (DAPTACEL)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP (DAPTACEL)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745962^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090425|20090425|106^DTaP (DAPTACEL)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP (DAPTACEL)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745963^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100412|20100412|50^DTaP/Hib (TriHIBit)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|

OBX|1|CE|38890-0^Component Vaccine Type^LN|1|20^DTaP^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
OBX|3|CE|38890-0^Component Vaccine Type^LN|2|48^Hib-PRP-T (ActHib; Hiberix)^CVX|||||F|
OBX|4|ID|59781-5^Dose Validity^LN|2|Y|||||F|
ORC|RE||137745964^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100105|20100105|48^Hib-PRP-T (ActHib; Hiberix)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|48^Hib-PRP-T (ActHib; Hiberix)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745977^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090105|20090105|133^Pneum Conj (PCV13)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|133^Pneum Conj (PCV13)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745978^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100105|20100105|133^Pneum Conj (PCV13)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|133^Pneum Conj (PCV13)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745979^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100412|20100412|133^Pneum Conj (PCV13)^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|133^Pneum Conj (PCV13)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137745980^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100105|20100105|03^MMR^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|03^MMR^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137750679^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100510|20100510|106^DTaP (DAPTACEL)^CVX|999|||00^New immunization record^NIP001||^^^*Queens Clinic Test||||123344A||UNK^Unknown Manufacturer^MVX|||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP (DAPTACEL)^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|N|||||F|
OBX|3|CE|30982-3^Reason applied by forecast logic to project this vaccine^LN|1|1005^This immunization event occurred prior to the recommended age or recommended interval for this dose.^NYCDOHINVSHOTCODES|||||F|
OBX|4|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP^CDCPHINVS|||||F|
ORC|RE||137750717^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20090105|20090105|10^IPV^CVX|999|||01^Historical information-source unspecified^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|10^IPV^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137750718^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100105|20100105|10^IPV^CVX|999|||00^New immunization record^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|10^IPV^CVX|||||F|
OBX|2|ID|59781-5^Dose Validity^LN|1|Y|||||F|
ORC|RE||137750719^NYC-CIR|||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100412|20100412|10^IPV^CVX|999|||00^New immunization record^NIP001||^^^*Queens Clinic Test|||||||CP|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|10^IPV^CVX|||||F|

OBX|2|ID|59781-5^Dose Validity^LN|1|Y||||||F|
ORC|RE||9999^NYC-CIR|||||||||^UNKNOWN55^UNKNOWN56|
RXA|0|1|20100715||998^No vaccine administered^CVX|999|
OBX|1|CE|75505-8^Disease with evidence of immunity^LN|1|371113008^Serology confirmed varicella^SCT||||||F|||20100715|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|88^Influenza NOS^CVX||||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20220701||||||F|||20221129|
OBX|3|DT|30981-5^Earliest date^LN|1|20220701||||||F|||20221129|
OBX|4|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN||||||F|||20221129|
OBX|5|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|45^HepB NOS^CVX||||||F|||20221129|
OBX|2|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13421-5^Complete^LN||||||F|||20221129|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|122^Rotavirus NOS^CVX||||||F|||20221129|
OBX|2|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13424-9^Too old - cannot complete the series because the latest age for receiving dose has passed^LN||||||F|||20221129|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|115^Tdap^CVX||||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20151011||||||F|||20221129|
OBX|3|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN||||||F|||20221129|
OBX|4|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|17^Hib NOS^CVX||||||F|||20221129|
OBX|2|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13421-5^Complete^LN||||||F|||20221129|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|109^Pneumococcal NOS^CVX||||||F|||20221129|
OBX|2|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|10^IPV^CVX||||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20121015||||||F|||20221129|
OBX|3|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN||||||F|||20221129|
OBX|4|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|||20221129|
ORC|RE||9999^NYC-CIR|

RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|03^MMR^CVX|||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20121015|||||F|||20221129|
OBX|3|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN|||||F|||20221129|
OBX|4|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP
Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|21^Varicella^CVX|||||F|||20221129|
OBX|2|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13421-5^Complete^LN|||||F|||20221129|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP
Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|187^Zoster (shingles, Shingrix)^CVX|||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20581015|||||F|||20221129|
OBX|3|DT|30981-5^Earliest date^LN|1|20581015|||||F|||20221129|
OBX|4|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13422-3^On Schedule/Not
complete^LN|||||F|||20221129|
OBX|5|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP
Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|83^HepA ped/adol 2-dose^CVX|||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20091015|||||F|||20221129|
OBX|3|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN|||||F|||20221129|
OBX|4|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP
Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|108^MenACWY NOS^CVX|||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20191015|||||F|||20221129|
OBX|3|DT|30981-5^Earliest date^LN|1|20191015|||||F|||20221129|
OBX|4|DT|59778-1^Overdue date^LN|1|20211111|||||F|||20221129|
OBX|5|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN|||||F|||20221129|
OBX|6|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP
Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|137^Human Papillomavirus NOS^CVX|||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20191015|||||F|||20221129|
OBX|3|DT|30981-5^Earliest date^LN|1|20171015|||||F|||20221129|
OBX|4|DT|59778-1^Overdue date^LN|1|20211111|||||F|||20221129|
OBX|5|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN|||||F|||20221129|
OBX|6|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP
Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999||||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|128^H1N1-09 NOS^CVX|||||F|||20221129|
OBX|2|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA4695-8^No longer
Recommended^LN|||||F|||20221129|

OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30979-9^Vaccine due next^LN|1|213^COVID-19, mRNA NOS^CVX|||||F|||20221129|
OBX|2|DT|30980-7^Recommended due date^LN|1|20221129|||||F|||20221129|
OBX|3|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA13423-1^Overdue^LN|||||F|||20221129|
OBX|4|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS|||||F|||20221129|
ORC|RE||9999^NYC-CIR|
RXA|0|1|20221129|20221129|998^No vaccine administered^CVX|999|||||||||||NA|
OBX|1|CE|30956-7^Vaccine Type^LN|1|206^Vaccinia, smallpox monkeypox (Jynneos)^CVX|||||F|||20221129|
OBX|2|CE|59783-1^Vaccine Group Recommendation Status^LN|1|LA4695-8^No longer Recommended^LN|||||F|||20221129|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS|||||F|||20221129|

RSP – No Match Found, No Errors

Storyboard

Amelia Sachs (Female, DOB 7/10/1973) visits the Queens Clinic for the first time. The Queens Clinic sends a query to the CIR HL7 Web Service for patient's immunization history using a 2.5.1 QBP message, profile Z34. In additional to Amelia's name, sex, and date of birth, Queens Clinic also populates the QBP with Amelia's medical record number at the Clinic, Medicaid number, address, cell phone number, and multiple birth status. The Queens Clinic does not have a CIR ID for Amelia or they would also include that in the QBP. The QBP message did not contain any errors.

When the CIR HL7 Web Service receives the QBP, it searches for the patient and returns an RSP letting the Clinic know that no matching patient was found. Since there were no errors in the QBP, in the RSP message QAK-2 (Query Response Status) will contain a value of "NF" indicating no matching patients were found and MSA-1 (Acknowledgement Code) will be valued with "AA" indicating there were no errors.

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH |Patients First 1.1|8000N70|20121023125341-0400||RSP^K11^RSP_K11|20121023125341-0400CIR-WS|T|2.5.1|||NE|NE|||||Z33^CDCPHINVS|

MSA|AA|23487290874920|

QAK|QT130473|NF|Z34^Request Immunization^CDCPHINVS|

QPD|Z34^Request Immunization History^CDCPHINVS|QT130473|SACHS239870^^^8000N70^MR~AA33233S^^^^MA|Sachs^Amelia^^^^^L||19730710|F|305 West 72nd Street&West 72nd Street&305^^New York^NY^12345^^P|^PRN^CP^^^347^3962491|N|

RSP – Too Many Matches Found, No Errors

Storyboard

A new patient, Sharon Valerii (Female, DOB 12/03/1990), visits the Queens Clinic for the first time. The Queens Clinic sends a query to the CIR HL7 Web Service for the patient's immunization history using a 2.5.1 QBP message, profile Z34. The only information Queens Clinic includes in the query is Sharon's first and last name, sex, and date of birth. Other information that could be used to search for a matching patient, such as Sharon's CIR ID, medical record number with the Clinic, middle name, address, phone number, and mother's maiden name, were known by the clinic but not included in the query. While the QBP message was only minimally populated with data, it did not contain any errors.

When the CIR HL7 Web Service receives the QBP, it searches for the patient and returns an RSP letting the Queens Clinic know that too many (more than one) matching patients were found. Since there were no errors in the QBP, in the RSP message QAK-2 (Query Response Status) will contain a value of "TM" indicating too many matching patients were found and MSA-1 (Acknowledgement Code) will be valued with "AA" indicating there were no errors.

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 1.1|8000N70|20121207152412-0500||RSP^K11^RSP_K11|20121207152412-0500CIR-WS|T|2.5.1|||NE|NE|||||Z33^CDCPHINVS|

MSA|AA|723020802738590|

QAK|QT216987|TM|Z34^Request Immunization History^CDCPHINVS|

QPD|Z34^Request Immunization History^CDCPHINVS|QT216987||Valerii^Sharon^^^^^L||19901203|F|

RSP – Single Match Found with Non-Fatal Errors in QBP

Storyboard

A new patient, Michael Worf Moge (Male, DOB 12/09/1952), visits the Queens Clinic for the first time. The Queens Clinic sends a query to the CIR HL7 Web Service for the patient's immunization history using a 2.5.1 QBP message, profile Z34. That query contained the following non-fatal errors:

- QPD-8.5 (Zip Code): valued with 4 rather than 5 digits
- QPD-9.6 (Area Code): not valued
- QPD-9.6 (Phone Number): valued with 10 digits (both the area code and phone number)

When the CIR HL7 Web Service receives the QBP, it searches for the patient and returns an RSP letting the Queens Clinic know that a single matching patient was found; however, the following information in the RSP lets the Clinic know the QBP had one or more non-fatal error and no fatal errors:

- MSA-1 (Acknowledgement Code) of "AE"
- QAK-2 (Query Response Status) value of "OK"
- ERR-4 (Error Severity) value of "W" (Warning)

Fields containing non-fatal errors are disregarded and their data not included in the patient search. Had the clinic not included other patient data (such at the local registry ID, mother's maiden name, address, etc.), a single matching patient may not have been found. Details about the errors are provided in the ERR segments.

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 1.1|8000N70|20121210165926-0500||RSP^K11^RSP_K11|20121210165926-0500CIR-WS:778334175|T|2.5.1|||NE|NE|||||Z32^CDCPHINVS|

MSA|AE|898987477894|

ERR||QPD^1^8^1^5|102^Data type error^HL70357|W|BadFormat^^HL70357|||Patient_Address_Zip: BadFormat|

ERR||QPD^1^9^1^7|102^Data type error^HL70357|W|ValueExceedMaxLen^^HL70357|||Patient_Home_Phone: ValueExceedMaxLen|

ERR||QPD^1^9^1^6|102^Data type error^HL70357|W|ValueMissing^^HL70357|||Patient_Home_AreaCode: ValueMissing|

QAK|QT24327|OK|Z34^Request Immunization History^HL70471|

QPD|Z34^Request Immunization History^CDCPHINVS|QT24327|778334175^^^BAA^LR|Moge^Michael^Worf^^^^L|Rozhenko^Helena^^^^^M|19521209|M|2361 KHITOMER COLONY ROAD&KHITOMER COLONY ROAD&2361^^New York^NY^1234^^P|^PRN^^^^^2125551212|Y|1|

PID|1||778335175^^^^LR||DORN^MICHAEL^WORF^^^^L||19521209|M|2361 KHITOMER COLONY ROAD&KHITOMER COLONY ROAD&2361^^New York^NY^12345^^P|

ORC … (*The remaining portion of the RSP, providing vaccine history and forecasting, is intentionally omitted from this example. To see an example of a full RSP providing vaccine history and forecasting, go to the "RSP – Single Match Found, No Errors" section of Appendix B.*)

RSP – Fatal Errors in QBP

Storyboard

The Queens Clinic sends a query to the CIR HL7 Web Service for the patient's immunization history using a 2.5.1 QBP message, profile Z34; however, they do not include the patient's date of birth in the query. The CIR HL7 Web Service requires that basic information, such as patient's first and last name (QBD-4), patient's date of birth (QPD-6), and patient sex (QPD-7) is included in a query.

When the CIR HL7 Web Service receives the QBP, it searches for the patient and returns an RSP letting the Queens Clinic know that the Patient DOB (a required field in a required segment) was missing. The following information in the RSP lets the Clinic know the QBP had a fatal error that caused the message to be rejected:

- MSA-1 (Acknowledgement Code) of "AE"
- QAK-2 (Query Response Status) value of "AE"
- ERR-4 (Error Severity) value of "E" (Error)

Details about the error are provided in the ERR segment.

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 1.1|8000N70|20121207154633-0500||RSP^K11^RSP_K11|20121207154633-0500CIR-WS|T|2.5.1|||NE|NE|||||Z33^CDCPHINVS|

MSA|AE|74389027|

ERR||QPD^1^6^2|101^Required field missing^HL70357|E|RequiredField^^HL70357|||Patient_DOB: RequiredField|

QAK|QT216987|AE|Z34^Request Immunization History^HL70471|

QPD|Z34^Request Immunization History^CDCPHINVS|QT216987||Mason^Melinda^^^^^L|||F|

ACK – QBP Not Interpretable

Storyboard

The Queens Clinic sends a query to the CIR HL7 Web Service for the patient's immunization history using a 2.5.1 QBP message, profile Z34; however, the message is malformed to the extent that it cannot be parsed (interpreted).

When the CIR HL7 Web Service receives the QBP, it attempts to parse (interpret) the message. The CIR HL7 Web Service then returns an ACK to the Queens Clinic advising the Clinic that the QBP was rejected because it cannot be interpreted by the CIR HL7 Web Service. Errors, to the extent possible, are described in the ERR segment(s).

When the CIR HL7 Web Service returns an HL7 formatted ACK message in response to a QBP message:

- The CIR HL7 Web Service will return a value of "AR" in MSA-1 (Acknowledgement Code).
- The details of the fatal errors, as well as any non-fatal errors, will be reported in the ERR segment(s). Fatal errors will have an ERR-4 (Error Severity) value of "E" for "Error" while non-fatal errors will have an ERR-4 value of "W" for "Warning".

Message

MSH|^~\&|CIR HL7 WS 1.81 PROD|NYC DOHMH|Patients First 1.1|5555R55|20121209180243-0500||ACK|20121209180243-0500CIR-WS|T|2.5.1||||ER|||||Z23^CDCPHINVS|

MSA|AR|RAT593367|

ERR|||207^Application internal error^HL70357|E||||Improperly Formatted Message|

Appendix C: Initial Connectivity Testing Using soapUI

Connectivity Test

After getting credentials, the next step, before building or modifying software, is to perform an initial connectivity test using soapUI. Performing an initial connectivity test using soapUI allows an HL7 Data Exchange Partner to:

- Verify that, outside of your software, you can establish connectivity.
- Eliminate the possibility that issues, such as a firewall, network, or proxy issues, are blocking connectivity.

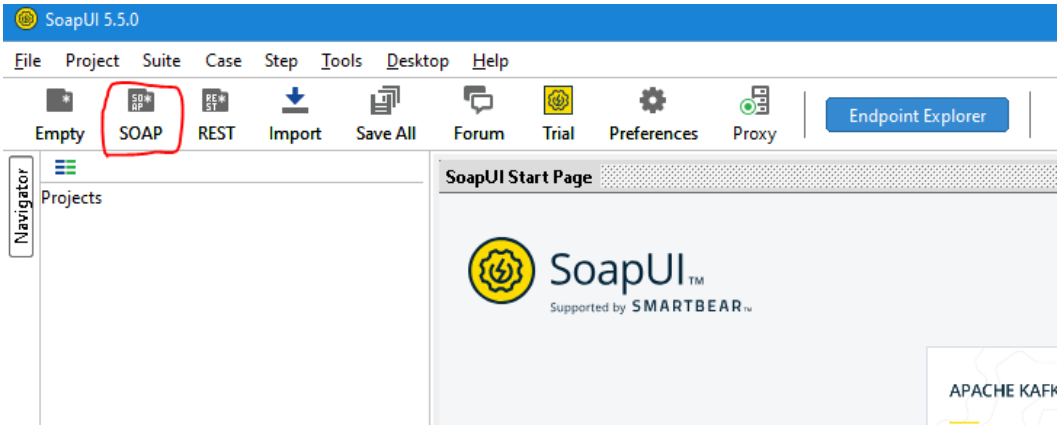
When a connectivity test is performed, the connectivityTest operation returns to the HL7 Data Exchange Partner whatever text string the partner submits to the operation, appended with a statement of the date and time that the message was received by the service. If a calling system receives an echo of the data that it submitted to this operation, then it confirms all of the following conditions (assuming that soapUI and the Partner's system are running on the same host):

- There is network connectivity between the partner's system and the CIR HL7 Web Service.
- The CIR HL7 Web Service is up and running.

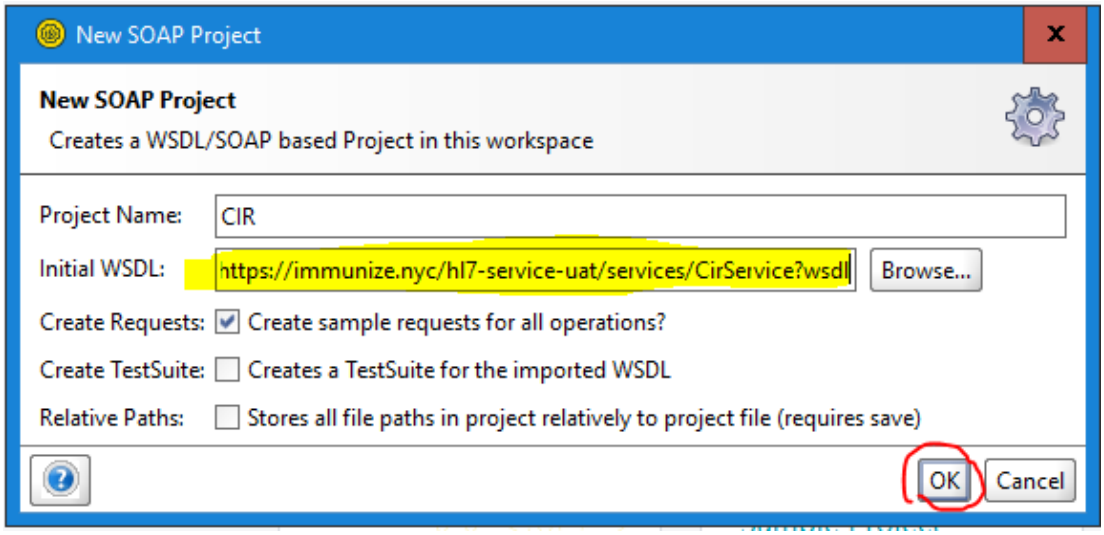
To perform initial connectivity testing using soapUI, follow the instructions below.

Download and install the soapUI tool https://www.soapui.org/downloads/soapui/

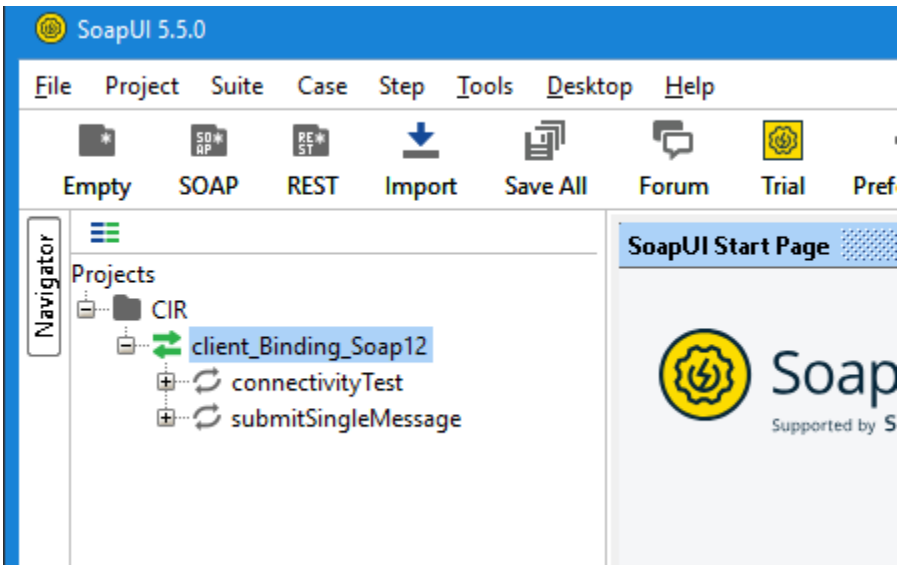
1. **Launch the SoapUI tool**
    a. Click on SOAP to create a new SOAP project.



2. **Add the WSDL**
    a. Type in the CIR WSDL, https://immunize.nyc/hl7-service-uat/services/CirService?wsdl.
    b. Select "OK".



c. You will then see a project generate at the lefthand side of the application containing two main objects, connectivityTest and submitSingleMessage.



3. Run Connectivity Test

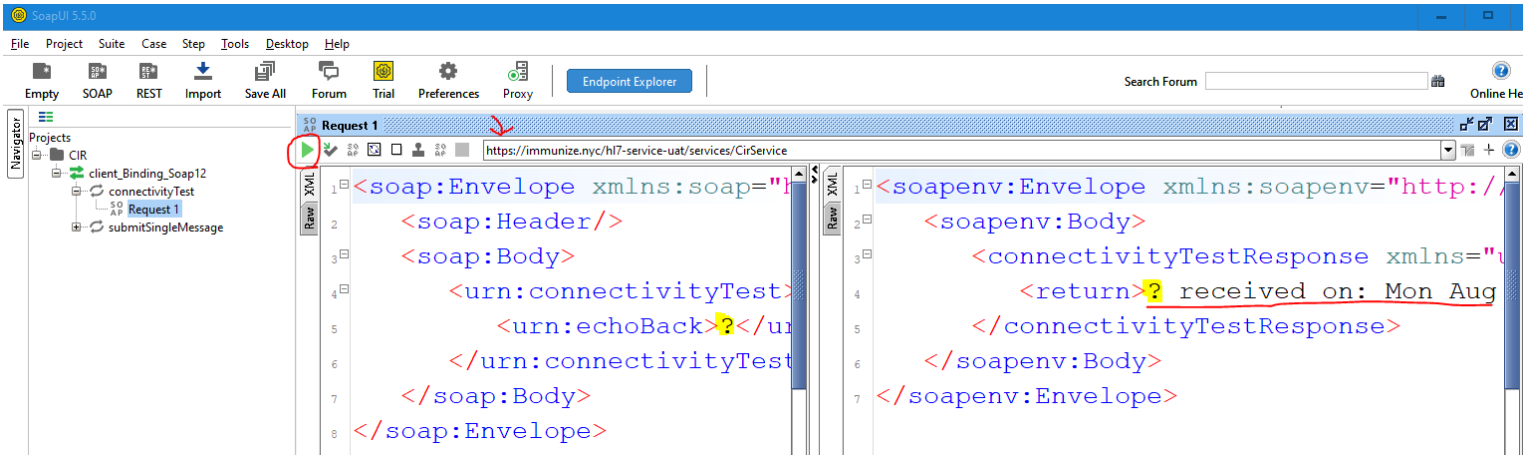
a. Expand the CirService treeview until you can access “Request 1” under “connectivityTest”

b. Double-click “Request 1”

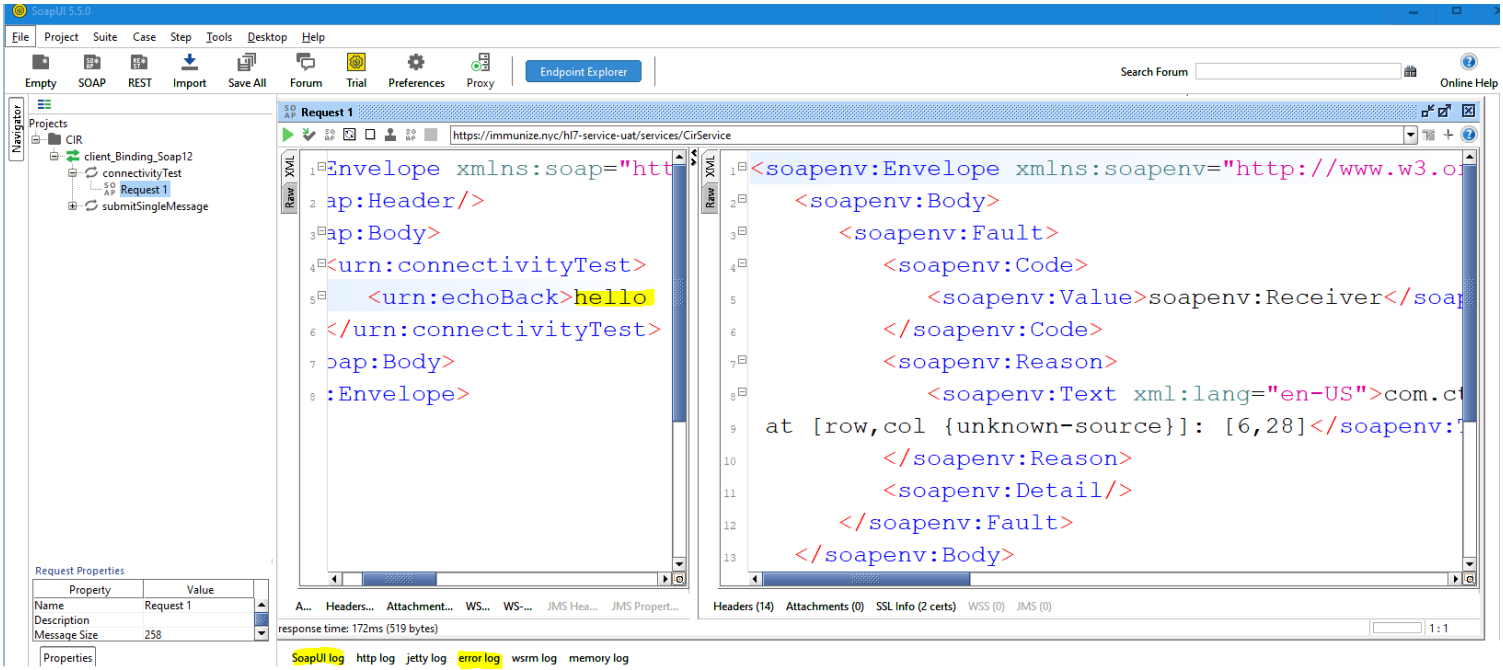
c. At the top of the Request 1 window, there is a dropdown that allows you to select either the UAT or Production web service. Select either the Production or UAT (test environment) URL. The screenshot contains the UAT URL.

d. Click the green arrow at the top, left of the Request 1 window to submit.

e. If the connection was successful, you will receive a response echoing the supplied message text along with the date and time the message was received.



f. If the test was not successful, use the response as well as the soapUI log and error log to help diagnose the problem. The soupUI log displays when you click “soupUI log” located at the bottom of the screen. The error log displays when you click “error log” located at the bottom of the screen. For example, if you tried replacing “?” in the connectivity test with your own test message, but, in doing so, accidently changed the message structure, the response includes the following: “WstxParsingException: Unexpected close tag </urn:connectivityTest>; expected </urn:echoBack>.”:



Submit Single Message Test

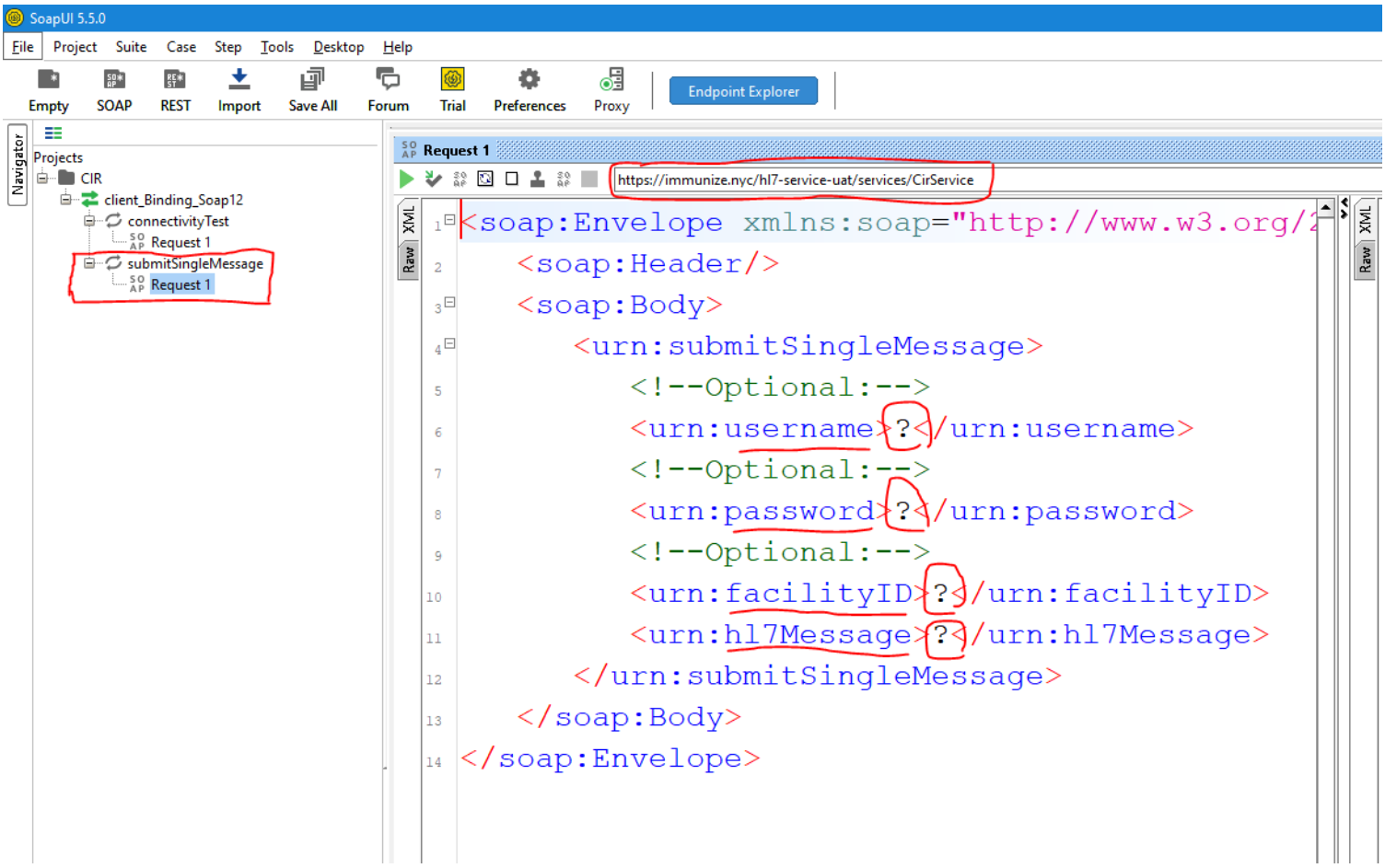
The project's next object is submitSingleMessage operation. HL7 Data Exchange Partners can use the submitSingleMessage operation to verify:

- The Username and Password are correct, and that basic authentication is successful.
- The Sending Facility Code is a valid CIR issued facility code and matches the account associated with the username and password.

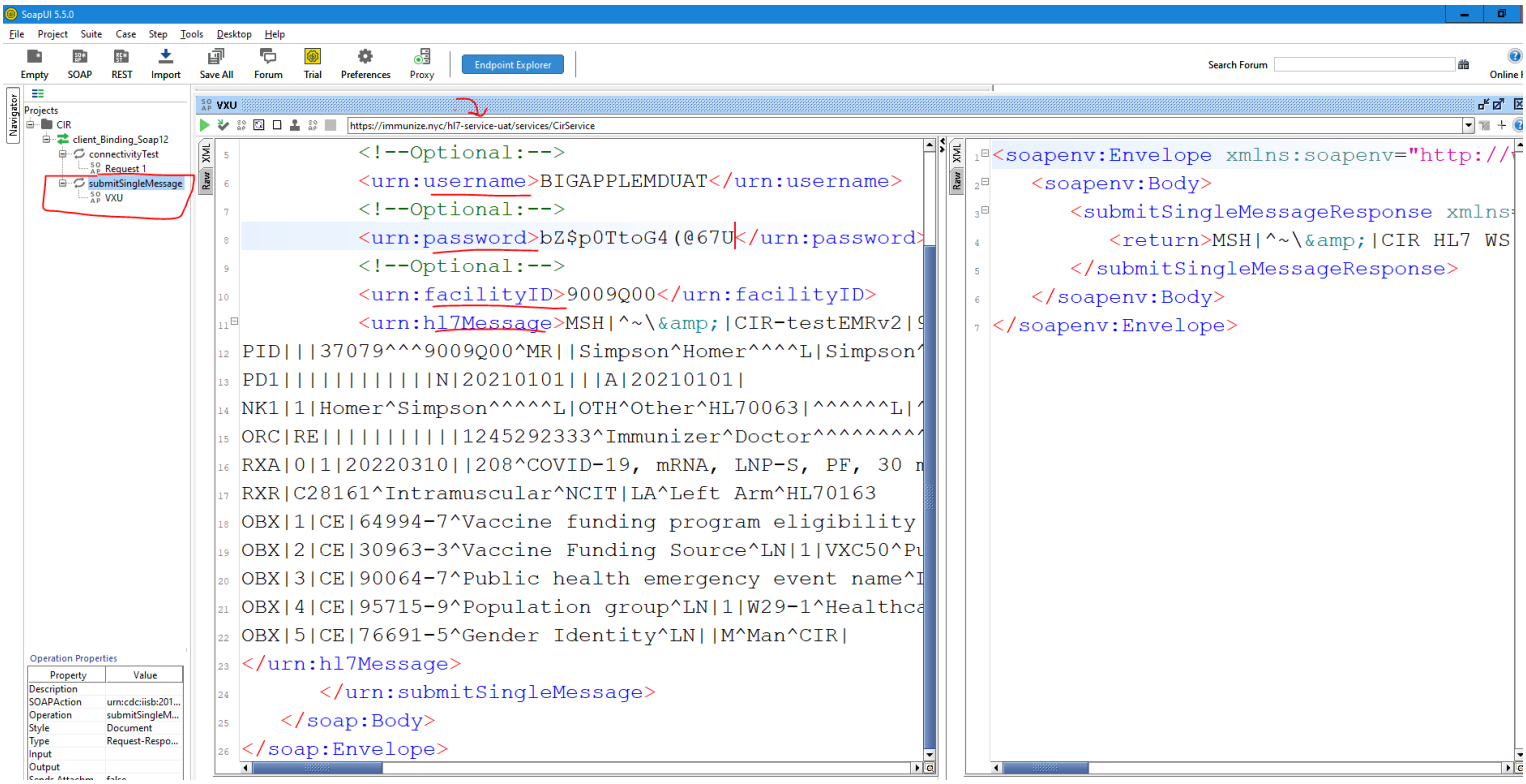
This operation allows the data exchange partner to submit both VXU and QBP messages.

Run Submit Single Message Test – VXU

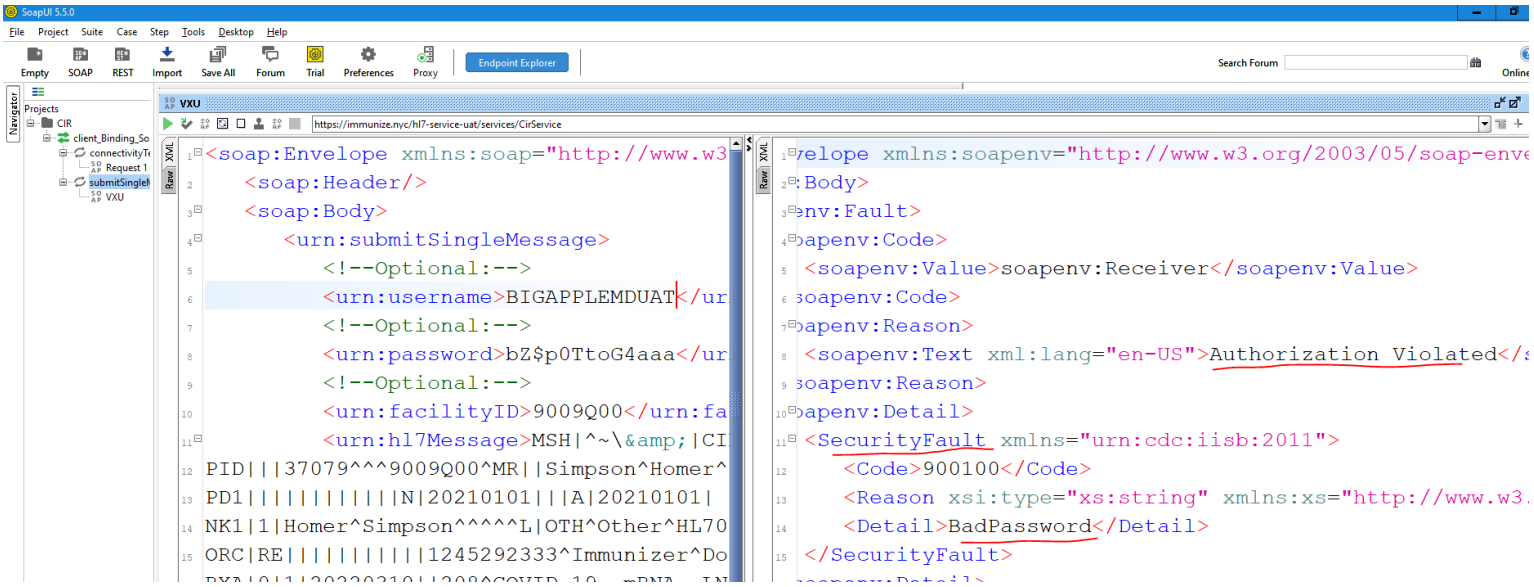
1. Expand the "submitSingleMessage" view until you can see "Request 1".
2. Double-click on "Request 1". You should see an empty request.
    a. You can change URL either the Production or UAT (test) environment URL.
    b. You may rename the SOAP request, "Request 1" to "VXU".



3. Within the SOAP request “VXU” window:
    a. Replace “?” with the username provided to you by the CIR. Pay close attention to which credentials you use. You may receive test credentials first and later production credentials.
    b. Replace “?” with the password provided to you by the CIR.
    c. Replace “?” with the CIR facility code of the sending facility.
    d. Replace “?” with the HL7 VXU message that you will be submitting to the CIR. You may use the test example below in the *Compare Message and Message Envelopes* section.
    e. Ensure that the Processing ID in MSH-11 matches the environment/URL you have selected; use “P” for Production or “T” for UAT (test).



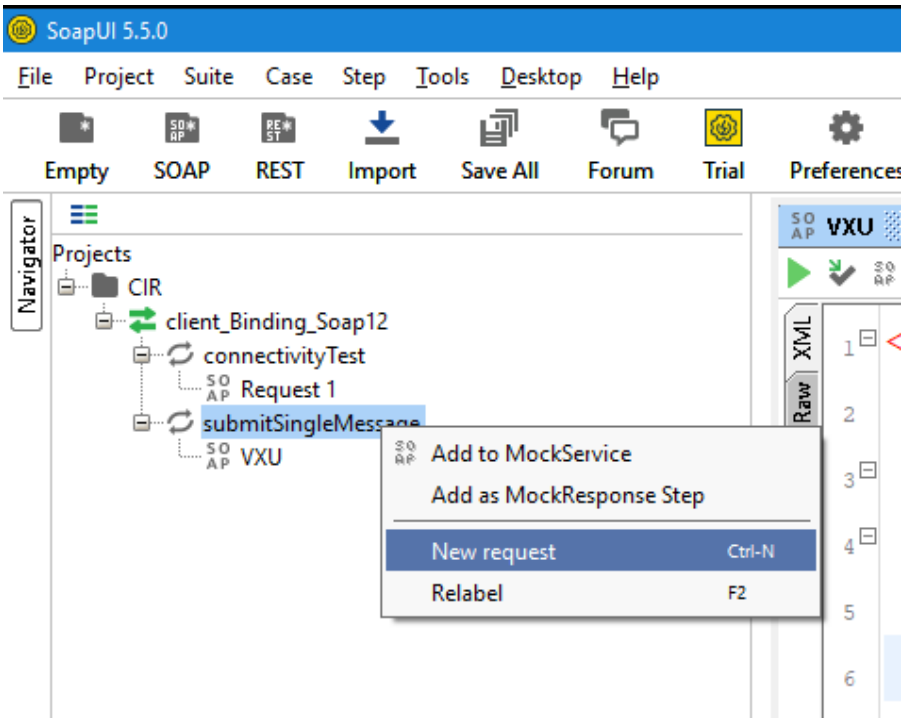
4. Once you have entered your username, password, and facility code, click the green arrow at the top, left of the VXU window to submit.
5. If the submit single message test was successful, you will receive a response containing an ACK message with an MSA-1 value of AA, indicating no errors.
6. If the submit single message test was not successful due to an incorrect username and/or password, an ACK will not be returned. Rather, a response advising there was a SecurityFault will be returned asking you to verify you are using the correct username and password.



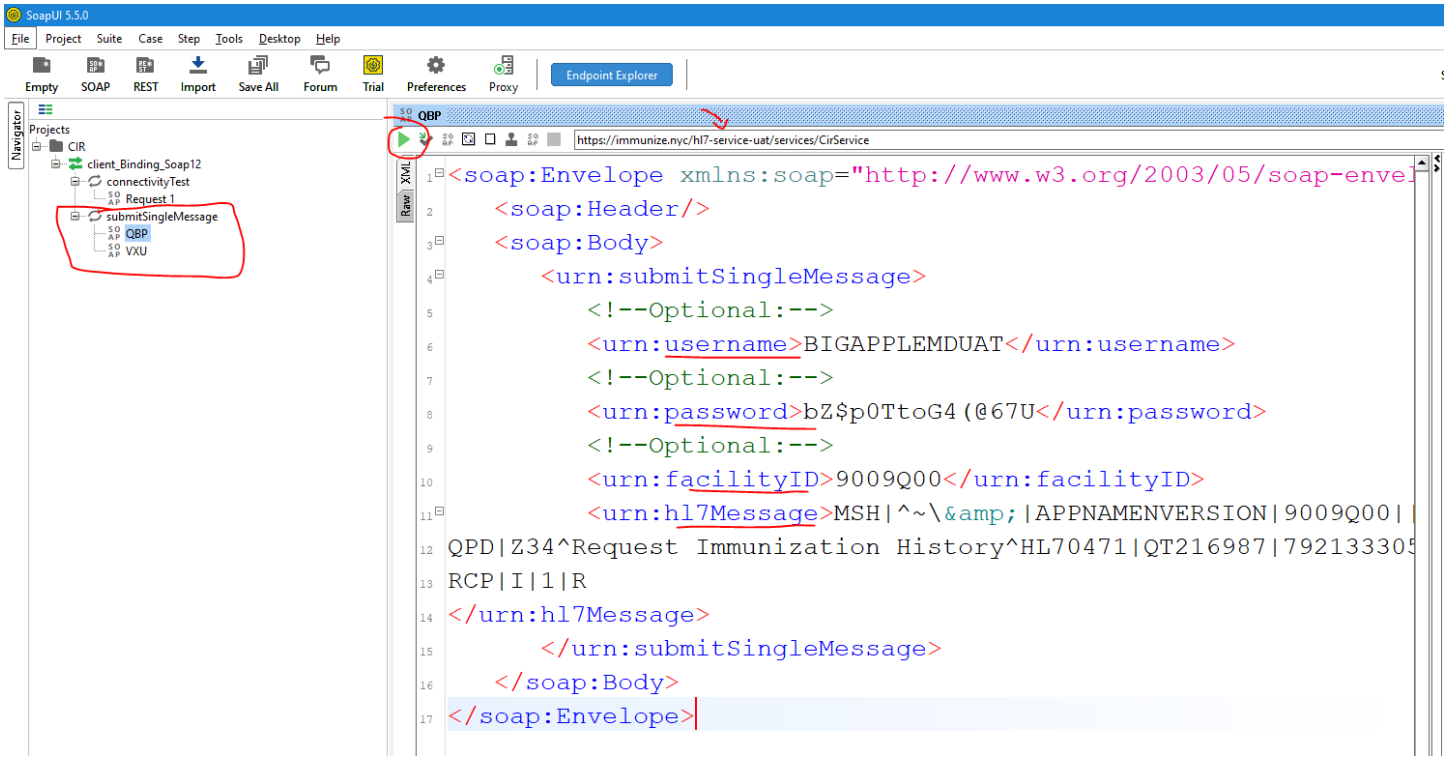
7. If the submit single message test was not successful due the facility code (either the code provided was not a valid CIR facility code or the code provided was a valid CIR facility code, but it did not match the account associated with the username and password), the response will include an ACK message with an MSA-1 value of AE, indicating a fatal error. Error details will be provided in the ERR segment.

Run Submit Single Message Test – QBP

1. Return to the project treeview and create a new SOAP request, “QBP”.



2. Within the SOAP request “QBP” window:
    a. Replace “?” with the username provided to you by the CIR.
    b. Replace “?” with the password provided to you by the CIR.
    c. Replace “?” with the CIR facility code of the sending facility.
    d. Replace “?” with the HL7 QBP message that you would like to send to the CIR. You may use the test QBP message below in the *Compare Messages and Message Envelopes* section.
    e. Ensure that the Processing ID in MSH-11 matches the environment/URL you have selected; use “P” for Production or “T” for UAT (test).
3. Once you have entered your username, password, and facility code, click the green arrow at the top, left of the QBP window to submit.
4. If the submit single message test was successful, you will receive a response containing an RSP message with an MSA-1 value of AA, indicating no errors.



5. If the submit single message test was not successful due to an incorrect username and/or password, an RSP will not be returned. Rather, a response advising there was a SecurityFault will be returned asking you to verify you are using the correct username and password.
6. If the submit single message test was not successful due the facility code (either the code provided was not a valid CIR facility code or the code provided was a valid CIR facility code, but it did not match the account associated with the username and password), the response will include an RSP message with an MSA-1 value of AE, indicating a fatal error. Error details will be provided in the ERR segment.

Compare Messages and Message Envelopes

HL7 Data Exchange Partners should compare the messages generated by their software with the sample messages provided in the project file. For example, below is both a sample VXU and QBP message, including the message envelope and http protocol:

VXU

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:urn="urn:cdc:iisb:2011">
  <soap:Header/>
  <soap:Body>
    <urn:submitSingleMessage>
      <!--Optional:-->
      <urn:username>BIGAPPLEMDUAT</urn:username>
      <!--Optional:-->
      <urn:password>bZ$p0TtoG4(@67U</urn:password>
      <!--Optional:-->
      <urn:facilityID>9009Q00</urn:facilityID>
      <urn:hl7Message>MSH|^~\&amp;|CIR-testEMRv2|9009Q00|||20220309144148-
0500||VXU^V04^VXU_V04|messagecontrolID#0012|T|2.5.1|||ER|AL||||Z22^CDCPHINVS|9009Q00
```

PID|||37079^^^9009Q00^MR||Simpson^Homer^^^^L|Simpson^Mona|19570101|M||2076-8^Native Hawaiian or Other Pacific Islander^CDCREC|123 Main St^^Anywhere^NY^11101||^PRN^CP^^^917^9999999||Eng||||||2186-5^Not Hispanic or Latino^CDCREC|
PD1||||||||||||N|20210101|||A|20210101|
NK1|1|Homer^Simpson^^^^^L|OTH^Other^HL70063|^^^^^^L|^PRN^CP^^^123^4567890|
ORC|RE||||||||||1245292333^Immunizer^Doctor^^^^^^^^^^NPI|
RXA|0|1|20220310||208^COVID-19, mRNA, LNP-S, PF, 30 mcg/0.3 mL dose^CVX^59267-1000-3^COVID-19, mRNA, LNP-S, PF, 30 mcg/0.3 mL dose^NDC|0.3|mL^MilliLiter [SI Volume Units]^UCUM||00^New Immunization Record^NIP001||^^^9009Q00||||UI865AA|20250101|PFR^Pfizer^MVX|||CP|A
RXR|C28161^Intramuscular^NCIT|LA^Left Arm^HL70163
OBX|1|CE|64994-7^Vaccine funding program eligibility category^LN|1|V02^VFC eligible - Medicaid^HL70064|||||F|||5|||VXC40^Eligibility captured at the immunization level^CDCPHINVS
OBX|2|CE|30963-3^Vaccine Funding Source^LN|1|VXC50^Public Vaccine Stock^CDCPHINVS|||||F||||
OBX|3|CE|90064-7^Public health emergency event name^LN|1|COVID19^^CIR|||||F
OBX|4|CE|95715-9^Population group^LN|1|W29-1^Healthcare/Hospital Staff^CIR|||||F
OBX|5|CE|76691-5^Gender Identity^LN||M^Man^CIR|
OBX|6|CE|76690-7^Sexual Orientation^LN||QUR^Queer^STC|

</urn:hl7Message>
</urn:submitSingleMessage>
</soap:Body>
</soap:Envelope>

QBP

```
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:urn="urn:cdc:iisb:2011">
  <soap:Header/>
  <soap:Body>
    <urn:submitSingleMessage>
      <!--Optional:-->
      <urn:username>BIGAPPLEMDUAT</urn:username>
      <!--Optional:-->
      <urn:password>bZ$p0TtoG4(@67U</urn:password>
      <!--Optional:-->
      <urn:facilityID>9009Q00</urn:facilityID>
      <urn:hl7Message>MSH|^~\&amp;|APPNAMENVERSION|9009Q00|||20121012000000-0400||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL|||||Z34^CDCPHINVS|9009Q00
QPD|Z34^Request Immunization History^HL70471|QT216987|792133305^^^^LR~MasonMel56979^^^8000N70^MR~MM54321M^^^^MA|Mason^Melinda^Carol^^^^L|Walters^Rebecca^^^^^M|20081015|F|305 Big Apple Blvd&amp;Big Apple Blvd&amp;305^7C^New York^NY^12345-1234^^P|^PRN^PH^^^212^5551212|N|1|
RCP|I|1|R
</urn:hl7Message>
    </urn:submitSingleMessage>
  </soap:Body>
</soap:Envelope>
```

By comparing your software’s message with the sample QBP and VXU, you can ensure your software's 2.5.1 VXU and/or QBP messages are correct. If your generated message is failing when submitted via your software, the sample QBP and VXU messages may help you diagnosis why your message is failing. Failure is often due to an improperly constructed message. For example, a “Not Authorized” error is often caused by an improperly constructed message envelope. By taking the time to compare the message generated by your software to soapUI's message, including the http protocol and the message envelope, you can diagnose why your generated message may be failing. If you compare your generated message to the soapUI message and they differ, please make the change to your message and resubmit your message using your software.