Iowa Immunization Registry Information System (IRIS)

HL7 Implementation Guide

Local specifications for HL7 2.3.1 data exchange with IRIS

Version 2.0

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Table of Contents:

For Information about IRIS, contact us here: 800-374-3958

For Information about Health Level Seven, visit: www.hl7.org

IRIS

Thank you for your interest in Health Level Seven (HL7) electronic data exchange with IRIS. Getting timely and accurate immunization data into IRIS is important for your clinic and for the individuals you serve. IRIS is interested in finding the least burdensome method for your clinic to submit data to IRIS and to receive back meaningful data on patient histories and forecasts for upcoming immunizations.

Timely data submission to IRIS benefits providers and the patients they serve by making complete immunization records accessible through the system as soon as possible. IRIS staff will work with your team to identify the data exchange method, format, and frequency that makes most sense for your practice. IRIS is designed to send and receive real-time or batch data submission. If you are a public clinic, keep in mind that you are required to submit data within 14 days of vaccine administration.

Standardized HL7 messaging is the preferred format for exchanging data with IRIS. IRIS is designed to accept HL7 messages through a variety of methods. The preferred data exchange method is real-time messaging through the web service. HL7 batch messages uploaded through the IRIS User Interface or via SFTP are also considered valid data exchange methods. SFTP is an option for batch files only.

PHIN-MS will be supported in the initial IRIS release in Spring 2012. IRIS will have the capability to receive and send HL7 2.5.1 messages by Fall 2012.

Note: Throughout this document HL7 2.4 refers to the local (Iowa) implementation of the CDC HL7 2.3.1 (June 2006) Guide.

Scope of This Document

This HL7 Implementation Guide covers the format and content requirements for sending HL7 messages to IRIS and receiving back HL7 messages with patient history and forecast information. The guide represents the local (Iowa) implementation of the CDC's HL7 2.3.1 Implementation Guide (June 2006).
This document specifies how HL7 file messages are constructed for the purposes of IRIS. It covers only a small subset of the very extensive HL7 standard. Messages constructed from the guidelines in this document will fall within the HL7 standard for immunization specific messages. Construction and submission of other HL7 messages are beyond the scope of this document.

References

- The National Immunization Program within the Center for Disease Control (http://www.cdc.gov/vaccines/) has published an Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the HL7 Protocol (Implementation Guide 2.2, June 2006) with the purpose of keeping the use of HL7 (www.hl7.org) for immunization data as uniform as possible. This document is HL7 2.3.1 version 2.2 (June 2006) compliant which can be found at http://www.cdc.gov/vaccines/programs/iis/stds/standards.htm.

Health Level Seven (HL7) Standard

The ANSI HL7 standards are widely used for data exchange in the health care industry. The full standard is quite lengthy, covering a variety of situations in patient care and health care finance. No single application is likely to use all of its content. The CDC has worked with Immunization Information Systems (IISs) to create a set of HL7 messages that permit the exchange of immunization data. This document covers the subset of HL7 that will be used for patient and immunization records exchanged between IRIS and outside systems.

- The basic unit transmitted in an HL7 implementation is the **message**.
- Messages are made up of several **segments**, each of which is one line of text, beginning with a three-letter code identifying the segment type.
- Segments are in turn made up of several **fields** separated by a delimiter character. Delimiters can be defined by the user in MSH-2, which is the second field of the MSH segment. The required delimiters for immunization messages are:

Delimiter:	Definition/Meaning:
<CR> (Carriage Return)	Segment terminator
| (Pipe)	Field separator
^	Component separator
&	Sub-component separator
~	Repetition separator
\	Escape character

The details of how HL7 messages are constructed, for IRIS purposes, will be explained later in this document.

The example below shows the essentials of what a VXU message might look like. In this example, a message is being sent on behalf of Valley Clinic with a provider organization id of AL9999 to IRIS. The message consists of three segments.

```
MSH|^~\&||VALCLIN^AL9999||IRIS^^^^^^|20110201||VXU^V04|682299|P^|2.3.1^^|||AL
PID|||79928^^^^PI|A5SMIT0071^^^^^|SMITH^MARY^T^^^^^|JOHNSON^^^^^^^|20101212|F||
||
RXA|0|999|20110201|20110101|^^^90701^DTP^CPT|0.5
```

- The Message Header segment (**MSH**) identifies the owner (VALLEY CLINIC) of the information being sent and the receiver (IRIS). It also identifies the message as being of type **VXU^V04**. The VXU^V04 is an Unsolicited Vaccination Record Update, which is one of the message types defined by HL7.
- The Patient Identification segment (**PID**) gives the patient's name (MARY T SMITH), birth date (20101212, in YYYYMMDD format), and other identifying fields.
- The Pharmacy Administration segment (**RXA**) tells that a DTP vaccine, with CPT code 90701, was administered on February 1, 2011 (formatted as 20110201). Many fields are optional and this example may have more information included in it. Some segments can be repeated within a single message. In this example, the message could have included a second RXA segment to record another immunization given.

Valley Clinic (shown here as AL9999) may or may not be the actual transmitter of the message. HL7 does not specify how messages are transmitted. It is flexible enough to be used for both real- time interaction and batches (150MB maximum file size). The standard defines file header and file trailer segments, as well as batch header and batch trailer segments that are used when a number of messages are gathered into a batch for transmission as a file.

HL7 Message Types

IRIS uses seven message types for sending and receiving immunization data to/from IRIS: VXU, ADT, VXQ, VXR, VXX, QCK and ACK. The segments that are used to construct each message type are defined below.

[ ] Optional segment
{ } Repeating segment

VXU - Unsolicited Vaccination Record Update

For sending new and/or updated patient demographic information and immunizations. VXU may also be used to delete immunizations and may be sent with only patient demographic information.

MSH	Message Header
PID	Patient Identification
[PD1]	Patient Additional Demographic
[{NK1}]	Next of Kin / Associated Parties
{RXA}	Pharmacy / Treatment Administration
[RXR]	Pharmacy / Treatment Route (Only one RXR per RXA segment)
[{OBX}]	Observation/Result*

NOTE: For real time data exchange, a VXU message must contain |2.4^^| in MSH-12. Immunization deletions can be submitted for both batch and real-time submissions.

ADT - Update Patient Information

For sending patient demographic information inserts and updates without immunizations.

MSH	Message Header
PID	Patient Identification
[{NK1}]	Next of Kin / Associated Parties
[{OBX}]	Observation/Result*

Note: ADT messages may only be submitted through the batch process and are not acceptable for real-time submission at this time.

*The only OBX segment that is valid within an ADT message is one that specifies 'Contraindication' in the OBX-03 Value Type field. (i.e., 30945-0^Contraindication^LN)

VXQ - Query for Vaccination Record

For querying the IIS for a complete patient vaccination record and forecast.

MSH	Message Header Segment
QRD	Query Definition Segment
QRF	Query Filter Segment (IRIS has made this segment REQUIRED)

Note 1: For real time data exchange, a VXQ message must contain |2.4^^| in MSH-12. For a VXQ message, the MSH-09 field must contain |VXQ^V01| and the segments must be in the following sequence order:

```
MSH|^~\&||VALCLIN^AL9999||IRIS^^^|20110701||VXQ^V01|0000001|P^|2.4||||AL
QRD|20110701|R|I|000000001|||25^RD|^SMITH^MARY^T |VXI^VACCINE
INFORMATION^HL700048|IRIS^^^|
```

```
QRF|IRIS^^^||||~20101212~~~~Johnson~~~~|
```

VXR - Response To Vaccination Query Returning the Vaccination Record

```
MSH          Message Header Segment (One per message)
MSA          Message Acknowledgment Segment (One per message)
QRD          Query Definition Segment (One per message)
QRF          Query Filter Segment (One per message—required by IRIS)
PID          Patient Identification Segment (One per matching patient)
  [PD1]             Additional Demographics
[{NK1}]      Next of Kin Segment (Optional, zero or more per matching patient)
  [{
       RXA                 Pharmacy Administration
       [RXR]               Pharmacy Route
         [{OBX}]           Observation/Result Contraindications or Reactions
}]
[{OBX}]      Observation/Result Vaccines Due Next
```

When a patient has been uniquely identified (there is only one 'match' to the query), the response to the query is a VXR^V03 message that is generated and sent back to the querying organization.

IRIS will only return eligible vaccines. IRIS will not report vaccines that are ineligible due to age restrictions, contraindications or other such rules. IRIS will evaluate vaccines according to CDC/ACIP schedule.

VXR Message Detail

In addition to supplying the querying organization with patient specific demographic and immunization data (contained in the above segments), the VXR message also specifies immunization forecasting information, under 'Observation/Result Vaccines Due Next'. This information is supplied by generating five OBX segments per one vaccine recommendation. The set ID (OBX-01) for each OBX triplet, will be the sequential set number uniquely identifying the OBX set for an individual recommended vaccine. IRIS will report the Vaccination Schedule in the OBX segments through the specification of the LOINC code 30979-9 (Vaccines Due Next) and its sub-components in OBX-03. IRIS requires specification of OBX-05 when OBX-03 is specified and valid. Furthermore, IRIS has superimposed a CE data type on the OBX-05 field. The corresponding observation values will be specified in OBX-05. Combinations are as follows:

OBX-03	OBX-05
30979-9	HL70292 (Codes for vaccines administered CVX)
30979-9&30980-7	Date Vaccine Due (IRIS provides date recommended)
30979-9&30973-2	Next dose of vaccine due
30979-9&30981-5	Earliest date to give (IRIS provides)
30979-9&30982-3	Reason applied

Below you'll find an example of what a recommendation might look like in a VXR message response (see **bolded** OBX segments below).

```
MSH|^~\&|IRIS^^|IRIS^^||VALCLIN^AL9999|20111220||VXR^V03|0000001|P^|2.4^^|||AL
MSA|AA|0000001||0||0^Message Accepted^HL70357^^^
QRD|20111220|R|I|000000001|||25^RD^^^^^|^SMITH^MARY^T^^^^^^^^^^|VXI^VACCINE
INFORMATION^HL700048^^^|IRIS^^^^^^^^||1
QRF|IRIS^^^||||~20101212~~~~~~~~
PID|||^^^^SR^~7065570^^^^PI^~^^^^MA^||SMITH^MARY^T^^^^^||20101212|F|||^^^OR^^^^
^^^||||||||||||||||||
PD1||||||||||02^^^^^|||||A
PV1||R||||||||||||||||||
RXA|0|999|20110201|20110201|01^DTP^CVX^90701^DTP^CPT|1.0|||01^^^^^~145934957^IR
ISimmunization id^IMM_ID^^^||||||||||
OBX|1|CE|38890-0^COMPONENT VACCINE TYPE^LN|1|01^DTP^CVX^90701^DTP^CPT||||||F|
OBX|2|NM|38890-0&30973-2^Dose number in series^LN|1|1||||||F|
RXA|0|0|20101212|20101212|998^No Vaccine Administered^CVX|999|
OBX|1|CE|30979-9^Vaccines Due Next^LN^^^|1|107^DTaP, NOS^CVX^^DTaP,
NOS^CPT||||||F|
OBX|2|TS|30979-9&30980-7^Date Vaccine Due^LN^^^|1|20120412||||||F|
OBX|3|NM|30979-9&30973-2^Vaccine due next dose number^LN^^^|1|2||||||F|
OBX|4|TS|30979-9&30981-5^Earliest date to give^LN^^^|1|20120301||||||F|
OBX|5|CE|30979-9&30982-3^Reason applied by forecast logic to project this
vaccine^LN^^^|1|^ACIP schedule||||||F|
```

VXX - Response to Vaccination Query (Returning Multiple PID Matches)

MSH	Message Header Segment (One per message)
MSA	Message Acknowledgment Segment (One per message)
QRD	Query Definition Segment (One per message)
QRF	Query Filter Segment (One per message—required by IRIS)
{PID	Patient Identification Segment (One per matching patient)
[{NK1}]}	Next of Kin Segment (Optional, zero or more per matching patient)

When a health care provider participating in an immunization information system needs to obtain a complete patient vaccination record, a query (VXQ message) is sent to the immunization information system for the definitive (last updated) immunization record. When a query results in multiple patient matches, the VXX message response is generated. The VXX contains multiple patients and their demographic information but does not contain their vaccination information.

The number of matches that IRIS generates will depend on the value specified in the first component of the incoming QRD-07 Quantity Limited request field. IRIS will interpret the quantity specified in this field as the maximum number of patient matches that the requester desires. For instance, the value '5' would indicate the provider organization wants at most 5 patient matches to be sent back.

IRIS limits the number of patient matches sent back to a maximum of 10. The value 0 (zero) indicates the provider organization wants the maximum number of patient matches sent back, which will be the IRIS maximum of 10. A value of 10 or more in QRD-7 will again return at most the IRIS maximum of 10 patient matches.

If a query results in 100 matches and the original quantity specified in QRD-7 was 10, then IRIS generates 10 PID segments (and if applicable, associated NK1 segments) in the VXX response message.

The following scenarios outline when a VXX message will be sent back when multiple patient matches are found, but some of the patient records have been locked.

Scenario 1:
The following paragraph holds true, assuming that the VXQ has 0 in QRD-7 (meaning that the provider organization wants the maximum number of patients sent back).

If IRIS matches 10 patients and 8 of those patients have locked records, then only 2 patients will be sent back in the VXX message; the remaining 8 patients (having locked records) will not be sent back. The QRD-12 field (in the VXX) will reflect the total number of matches found in IRIS (10 in our example) and the querying organization will need to assume that the 8 patients that were not returned had locked records.

VXQ Example:

```
MSH|^~\&||VALCLIN^AL9999||IRIS|201201011235||VXQ^V01|001|P^|2.4|||AL
QRD|20120101|R|I|01|||0^RD|01^SALAMI^STUART^S^^|VXI^VACCINE
INFORMATION^HL700048|^IRIS||0|
QRF|IRIS||||~19900607~|
```

VXX Example:

```
MSH|^~\&||IRIS||QUERYINGORG|201201011235||VXX^V02|001|P^|2.4|||AL
MSA|AA|001||0||0^Message Accepted^HL70357^^^
QRD|20120101|R|I|01|||0^RD|01^SALAMI^STUART^S^^|VXI^VACCINE
INFORMATION^HL700048|^IRIS^^^||10|
QRF|IRIS||||~19900607~|
PID||123^^^^SR~^^^^PI^||SALAMI^BRAD^S^^|^^^^^|19900607|M||^^^^^|||
PID||456^^^^SR~^^^^PI^||SALAMI^CHARLES^^^^|^^^^^|19900706|M||^^^^^|||
NK1|1|SALAMI^CHARLES^^|SEL^SELF^HL70063|123STREETADDRESS^^CITY^IA^55555^USA^^^^
|(555)777-8888^^^^^^^^|
```

Scenario 2:
If IRIS matches one or more patients who have locked records, then a QCK is generated. The QCK message will be comprised of the MSH, MSA and QAK segments. The MSA-01 field will have a value of 'AE' (Application Error). The MSA-3 field will display a message similar to "Patient has an 'Record Lock Indicator' indicator = Yes." MSA-6 text will display, "Record not released".

VXQ Example:

```
MSH|^~\&||VALCLIN^AL9999||IRIS|20120301||VXQ^V01|0000001|P^|2.4|||AL
QRD|20120301|R|I|000000001|||0^RD|^SMITH^MARY^T |VXI^VACCINE
INFORMATION^HL700048|IRIS|
QRF|IRIS||||~20101212~~~~Johnson~~~~|
```

QCK Example:

```
MSH|^~\&|IRIS^^|IRIS^^||VALCLIN^AL9999|20111220||
QCK^|0000001|P^|2.4^^|||AL MSA|AE|0000001|Patient has an 'Record Lock
Indicator' indicator = Yes.|0||500^Record not released^HL70357^^^
```

```
QAK|000000001|NF|
```

QCK - Query General Acknowledgment

MSH	Message Header Segment
MSA	Message Acknowledgment Segment
[ERR]	Error
[QAK]	Query Acknowledgment Segment

A QCK message is generated when IRIS has processed the query message, but no match was found to the query parameters in the database. IRIS does NOT generate this response message for anything other than no match found (for successful VXQ processing). Remember, error messages are reported through the use of the ACK response message; therefore, the optional [ERR] segment will never be generated for the QCK response message.

ACK - General Acknowledgment

To acknowledge to the sender that a message has been received

MSH	Message Header
MSA	Message Acknowledgment
[ERR]	Error

Errors Reported in ACK

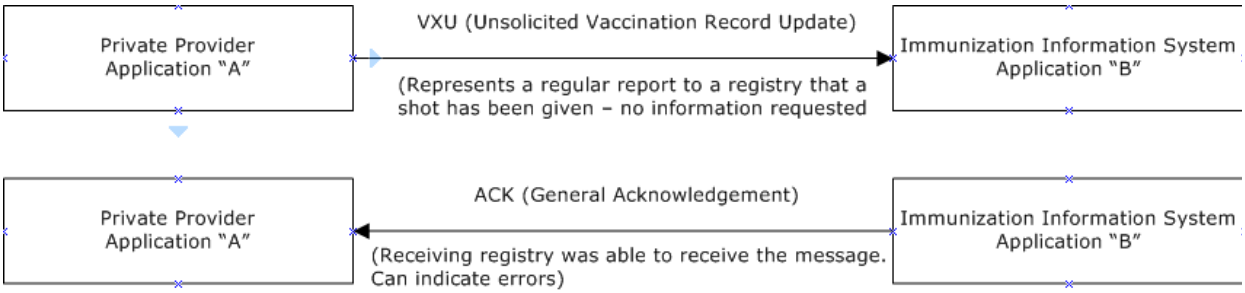
ACK messages are generated for message rejections and for informational error messages. Three conditions that result in message rejection are:

1. Sequencing (i.e. a PID segment must follow an MSH segment.)
2. Segment required fields contain no data.
3. Segment required fields contain invalid data.

Recommendation:

It is preferred that demographic information be sent in a VXU message whenever possible, as this message type accommodates BOTH immunization information and demographic update information. If necessary, IRIS will accept the following message types through batch processing only: ADT^A28 (New Patient), ADT^A31 (Update Patient), ADT^A24 (Link Patient), and A37 (Unlink Patient).

When a VXU^V04 (Unsolicited Vaccination Record Update) message type is sent with an RXA segment (immunization information) or an ADT, a check is done to verify if the patient exists in IRIS or not. If the patient already exists in IRIS, then the demographic update will occur (if all other update business rules apply) If the patient is new to IRIS, then the patient will be added to the database.



An ACK is also generated when an informational error message has occurred, but it has not resulted in message rejection (i.e. NK1 segment contains no last name). In this case, the segment is ignored but the remainder of the message is processed. An ACK message is generated with a message informing the sender of the problem. The error message in the text does NOT include "Message Rejected". The ACK contains the MSH, MSA and ERR segments.

Message Segments: Field Specifications and Usage

Notes:

- Each segment is one line of text ending with the carriage return/line feed (CR/LF) character. The CR/LF character is needed so that the HL7 messages are readable and printable. The messages may appear somewhat cryptic due to the scarcity of white space. (The standard has provisions for inclusion of binary data, but IRIS will not use these features.)
- Square brackets [ ] enclose optional segments and curly braces {} enclose segments that can be repeated; thus, an ADT message type could be composed of just MSH and PID segments.
- Any number of NK1 segments could be included in the message.
- The full HL7 standard allows additional segments within these message types, but they are not used by IRIS. In order to remain compliant with the HL7 standard, their use will not result in an error, but the recipient can ignore the content of the message. The segments that are documented here are sufficient to support the principal IRIS functions of storing data about patients and immunizations.

HL7 Segment Structure

Each segment consists of several fields that are separated by '|', which is the field separator character. The tables below define how each segment is structured and contain the following columns.

1. SEQ — The ordinal position of the field in the segment. Since IRIS does not use all possible fields in the HL7 standard, these are not always consecutive.
2. LEN — Maximum length of the field
3. DT — HL7 data type of the field. See below for definition of HL7 data types.
4. R/SE — R means required by HL7, and SE means strongly encouraged for IRIS IIS. Blank indicates an optional field.
5. RP/# — Y means the field may be repeated any number of times, an integer gives the maximum number of repetitions, and a blank means no repetition is permitted.
6. TBL# — Number of the table giving valid values for the field.
7. ELEMENT NAME — HL7 name for the field.

HL7 Data Types

Each field has an HL7 data type. Appendix A of this document lists and defines the HL7 data types needed for IRIS. The elemental data types Numeric (NM) and String (ST) consist of one value, while some data types, such as Extended Person Name (XPN) are composites.

Delimiter Characters

Field values of composite data types consist of several components separated by the **component separator**, '^'. When components are further divided into sub-components, these are separated by the **sub-component separator**, '&'. Some fields are defined to permit repetition separated by the **repetition character**, '~'. When these special characters need to be included within text data, their special interpretations are prevented by preceding them with the **escape character**, '\'.

```
MSH|^~\&| …
XXX|field1|component1^component2^subcomponent3.1&subcomponent3.2^component4|…
YYY|repetition1~repetition2| …
ZZZ|data includes escaped \|\~ special characters| …
```

In the example above, the Message Header segment uses the field separator, '|', immediately after the MSH code that identifies the segment. This establishes what character serves as the field separator throughout the message. The next field, the four characters '^~\&', establishes, in order, the component separator character, the repetition character, the escape character, and the sub- component separator character that will apply throughout the message. The hypothetical XXX segment includes field 1 with no internal structure, but the next field has several components separated by '^', and the third of these is made up of two sub-components separated by '&'. The hypothetical YYY segment's

first field permits repetition, in this example the two values 'repetition1' and 'repetition2'. The hypothetical ZZZ segment's field has a text value that includes the characters '|~', and these are escaped to prevent their normal structural interpretation.

In IRIS, sub-components, repetition and text values requiring the escape character will be rare. Components within fields are common, since names and addresses are represented this way. HL7 permits the use of other delimiters besides the recommended ones and the delimiters used in each message are given in the Message Header segment. *IRIS will always use the recommended delimiters when sending files and requires their use for files received.*

Rules for Sending Systems

The following rules are used by sending systems to construct HL7 messages.

- Encode each segment in the order specified in the message format. Begin the segment with the 3-letter segment ID (for example RXA).
- Precede each field with the data field separator ('|').
- Use HL7 recommended encoding characters ('^~\&').
- Encode the data fields in the order given in the table defining segment structure. Encode the data field according to its HL7 data type format.
- Since later fields in the segment are encoded by ordinal position, fields that are not present do not reduce the number of field separators in the segment. For example, when the second and third fields are not present, the field separators maintain the ordinal position of the fourth field: |field1|||field4
- Data fields that are present but explicitly null are represented by empty double quotes "". This is significant when updates are sent to existing records, because an empty field (shown as two field separators with nothing between them) will not alter the field in the IIS. Therefore, if you want to delete a value, put the "" pair in place of the field.
- Trailing separators may optionally be omitted. For example, |field1|field2||||| is equivalent to |field1|field2, when field3 and subsequent fields are not present.
- End each segment with the segment terminator (always the carriage return character, ASCII hex 0D).

Rules for Receiving Systems

The following rules are used by receiving systems to process HL7 messages.

- Treat data segments that are expected but not present as if all data fields in the segment were not present.
- Require use of HL7 recommended Field Separator |, and Encoding characters ^~\& for encoding messages.
- Ignore any data segment that is included but not expected, rather than treating it as an error. The HL7 message types used by IRIS may include many segments besides the ones in this document, and IRIS ignores them. IRIS will not send messages with segments not documented in this specification, but reserves the right to specify more segments at a later date. The rule to ignore unexpected segments facilitates this kind of change.
- Ignore data fields found but not expected within a segment.

The message segments below are needed to construct message types that are used by IRIS. Each segment is given a brief description excerpted from the HL7 standard. The tables define what fields make up each segment. Since IRIS does not use all the fields that HL7 defines, there are sometimes gaps in the ordinal sequence of fields. Following HL7 rules, the gaps do not diminish the number of field separators within the segment. For example, if the second and third fields in a segment are not present, their field separators remain in order to indicate that the next field present is the fourth: field1|||field4.

Master Field List

The Master Field List is a single correlated table, listing every informational field accepted by IRIS. For additional details on each field, please, refer to the documentation under the segment and field description.

Entity	Field	R/SE	HL7
Patient	Patient Identifier List (Internal ID)	R	PID-3
Patient	Patient Name	R	PID-5
Patient	Mother's Maiden Name	SE	PID-6
Patient	Date of Birth	R	PID-7
Patient	Sex (Gender)	R	PID-8
Patient	Patient Alias Name(s)		PID-9
Patient	Race		PID-10
Patient	Patient Address	SE	PID-11
Patient	Phone number – home	SE	PID-13
Patient	Ethnic Group		PID-22
Patient	Multiple Birth Indicator		PID-24
Patient	Birth Order		PID-25
Patient	Patient Death Date		PID-29
Patient	Publicity Code		PD1-11
Patient	Immunization registry status		PD1-16
Patient	Immunization registry status effective date		PD1-17
Patient	Publicity Code effective date		PD1-18
Next-of-Kin	Set ID – NK1	R	NK1-1
Next-of-Kin	Name		NK1-2
Next-of-Kin	Relationship		NK1-3
Next-of-Kin	Address		NK1-4
Next-of-Kin	Phone Number		NK1-5
Vaccination	Give Sub-ID Counter	R	RXA-1
Vaccination	Administration Sub-ID Counter	R	RXA-2
Vaccination	Date/Time Start of Administration	R	RXA-3
Vaccination	Date/Time End of Administration	R	RXA-4
Vaccination	Administered Code	R	RXA-5
Vaccination	Administered Amount	R	RXA-6
Vaccination	Administration Notes		RXA-9
Vaccination	Administering Provider		RXA-10

Entity	Field	R/SE	HL7
Vaccination	Administered-at location	R	RXA-11
Vaccination	Substance Lot Number	SE	RXA-15
Vaccination	Substance Manufacturer Name	SE	RXA-17
Vaccination	Substance Refusal Reason		RXA-18
Vaccination	Completion Status		RXA-20
Vaccination	Action code-RXA		RXA-21
Vaccination	Route	R	RXR-1
Vaccination	Site		RXR-2
Vaccination	Set ID – OBX		OBX-1
Vaccination	Value type		OBX-2
Vaccination	Observation Identifier	R	OBX-3
Vaccination	Observation sub-ID		OBX-4
Vaccination	Observation Value	SE	OBX-5
Vaccination	Observation Result Status	R	OBX-11
Vaccination	Date/Time of the Observation		OBX-14

Message Control Segments

Message control segments are used to define the characteristics of HL7 messages, and to handle administrative functions such as queries.

MSH – Message Header Segment

The MSH segment defines the intent, source, destination, and some specifics about the syntax of a message.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	1	ST	R			Field Separator
2	4	ST	R			Encoding Characters
3	180	HD				Sending Application
4	180	HD	SE			Sending Facility
6	180	HD				Receiving Facility
7	26	TS				Date/Time Of Message
9	7	M	R			Message Type Message
10	20	ST	R			Control ID
11	3	PT	R		0103	Processing ID
12	60	VID	R		0104	Version ID
15	2	ID			0155	Accept Acknowledgment Type

Field Notes:

MSH-1 Determines the field separator in effect for the rest of this message. IRIS requires the HL7 recommended field separator of '|'.

MSH-2 This field contains the four characters in the following order: the component separator, repetition separator, escape characters and sub-component separator. **IRIS requires ^~\&** (ASCII 94, 126, 92 and 38 respectively).

MSH-3 The name of the sending application. When receiving, IRIS will ignore this field. When sending, IRIS will use 'IRIS'. See MSH-4 and MSH-6 for the fields principally used to identify sender and receiver of the message.

MSH-4 Identifies for whom the message is being sent (the owner of the immunization data being sent). When sending, IRIS will use 'IRIS'. When the message is being sent to IRIS and the Provider Organization owning the information is different than the organization transmitting the message (as in a Data Source Parent/Child or Vendor/Client relationship), you must use the IRIS Organization ID of the Provider Organization that **owns** the information (e.g., AL9999.) Contact the IRIS Help Desk for the appropriate Organization Code.

Note: If the owner of the information and the transmitter of the information are the same Provider Organization, and the Provider Organization is not a member of a Data Source Parent/Child or Vendor/Client relationship, this field can be left blank. The data will be loaded with the transmitting organization as the owner of the immunization records. Since there is the potential for

transmitting files under an incorrect Provider Organization, we strongly encourage all users to indicate the owning provider Organization Code in MSH-4. This will allow the system to verify that you are transmitting from an organization that is the owner of the immunization records.

MSH-6 Identifies the message receiver. When sending, IRIS will use the Provider Organization Code assigned to the provider organization (referred to as your 'Org Code').

MSH-7 Date and time the message was created. IRIS ignores any time component. See the TS data type.

MSH-9 This is a required field. Two components of this field give the HL7 message type (see Table 0076) and the HL7 triggering event (see Table 0003). Within HL7, the triggering event is considered to be the real-world circumstance causing the message to be sent. For IRIS purposes, this field should have the value VXU^V04 for a message conveying patient and immunization information. Alternatively, one of four ADT values (ADT^A24, ADT^A28, ADT^A31, and ADT^A37) for a message conveying patient information is also acceptable via HL7 batch processing but not HL7 real-time processing. IRIS does not differentiate between the ADT triggering event values; internal business processing rules determine if a patient is inserted or updated in the system. In acknowledgement messages the value ACK is sufficient and the second component may be omitted.

MSH-10 This is a required field. Message rejection will result if nothing is received in this field. The message control ID is a string (which may be a number) uniquely identifying the message among all those ever sent by the sending system. It is assigned by the sending system and echoed back in the ACK message sent in response to identify any errors in the record. It is important to have this be an ID that the provider can use to identify the submitted record.

MSH-11 See Table 0103. The processing ID to be used by IRIS is 'P' for production processing. If this field is null, an informational message is generated indicating that IRIS is defaulting to 'P'.

MSH-12 See Table 0104. This is a required field. For the parser, the version number that is read in the first MSH segment, of the file, will be the version assumed for the whole file. Indicate a value of '2.4' if sending HL7 real time. If there is no version number found in the first MSH segment, a hard error will occur and the file will not be processed.

MSH-15 See Table 0155. This field controls whether an enhanced acknowledgement (ACK) is generated for the message being sent. If the field is empty, IRIS will assume a value of ER.

Example 1:

A message sent using the value 'ER' (Error/Reject conditions only) in MSH-15 with a known issue will reject the file. In this instance you can see that the ACK is returned with the error message stated in the MSA segment.

```
MSH|^~\&|IRIS1.0.0|IRIS||AL9999|20120215125421||ACK|MSG00002|P|2.4|||
MSA|ER|MSG00002|Record Rejected - Invalid first name (FNAME001).
```

Example 2:

In this example we used the same file as used for example 1 above. The only change to the file was that we are now using a value of "NE" (Never) in MSH-15. You will notice the system generates an ACK, but does not return the MSA segment indicating that the file was rejected.

```
MSH|^~\&|IRIS1.0.0|IRIS||AL9999|20120216092143||ACK|MSG00002|P|2.4|||
```

MSA – Message Acknowledgment Segment

The MSA segment contains information sent by the IRIS to acknowledge an incoming message.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	2	ID	R		0008	Acknowledgement Code
2	20	ST	R			Message Control ID
3	80	ST				Text message
4	15	NM				Expected sequence number
5	1	ID				Delayed acknowledgement type
6	100	CE				Error condition

Field Notes:

MSA-1 See Table 0008. The acknowledgment code indicates the disposition of the message. This is a required field. IRIS generates an AA (Application Accept) meaning the message was processed and accepted normally. AE (Application Error) means an error prevented normal processing. An AR is generated if a match is found, but the 'Record Lock' indicator is checked. An error message will be put in MSA-3, and for ACK messages the optional ERR segment will be included.

MSA-2 The message control ID is the unique ID that is sent by the sending system. This is a required field. It allows the sending system to associate each message with a response. In a response, this will be the same as the control ID that was sent in MSH-10 by the sending system.

MSA-3 This optional field further describes an error condition. When a message has been rejected, IRIS generates "Message Rejection" as the first portion of the text describing the error message. Informational messages will not contain "Message Rejection".

MSA-4 This optional numeric field is used in the sequence number protocol. IRIS does not generate this field.

MSA-5 Delayed Acknowledgement type. IRIS does not generate this field.

MSA-6 Error Condition. IRIS does not generate this field.

ERR – Error Segment

The Error segment (ERR) is used to add error comments to acknowledgment messages. If the message was rejected for functional reasons, this segment will locate the error and describe it using locally established codes.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	80	CM	R	Y	0357	Error code and location

Field Notes:

ERR-1 See the Table 0357. This is a composite field with four components, ordered as follows:

<segment ID (ST)>^<sequence (NM)>^<field position (NM)>^<code identifying error (CE)>

The first component identifies the segment ID containing the error. The second component identifies the input file line number of the segment containing the error. The third component identifies by ordinal number the field containing the error. The fourth component identifies, by ordinal number, the field component containing the error (0 is used if not applicable) The remaining five components of the CE data type are not valued and their '^' separators are not generated. Note that error text is transmitted in field MSA-3.

Example:
The NK1 segment is missing a mandatory field:

```
MSH|^~\&||IRIS||QUERYINGORG|20120201||VXQ^V01|001|P^|2.4|||AL
MSA|AE|001|Invalid relationship code. Defaulting to
Guardian|3||102^Invalid data value^HL70357^^^
ERR|NK1^16^3^0
```

QAK – Query Acknowledgment Segment

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	32	ST	R			Query Tag
2	2	ID	R		0208	Query response status

Field Notes:

QAK-1 This field is valued by the initiating system to identify the query and can be used to match response messages to the originating query. If it is valued, the

responding system is required to echo it back as the first field in the QAK. IRIS uses the value specified in the QRD-04 (of the VXQ) for the QAK-01 query tag value.

QAK-2 This field allows the responding system to return a precise response status. Refer to HL7 table 0208 for values. IRIS only generates NF (no data found, no errors) for this field.

Example:

```
MSH|^~\&|IRIS^^|IRIS^^||VALCLIN^AL9999|20120421||QCK^|0000001|P^|2.4^^|||
AL
MSA|AA|0000001||0||0^Message Accepted^HL70357^^^
QAK|000000001|NF|
```

QRD – Query Definition Segment

This segment is used to define a query.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	26	TS	R			Query date/time
2	1	ID	R		0106	Query Format Code
3	1	ID	R		0091	Query Priority
4	10	ST	R			Query ID
7	10	CQ	R		0126	Quantity limited request
8	60	XCN	R	Y		Who subject filter
9	60	CE	R	Y	0048	What subject filter
10	60	CE	R	Y		What department data code
11	20	CM		Y		What data code value qualifier
12	1	ID				Query results level

Field Notes:

QRD-1 Date the query was generated by the application program. IRIS requires this field and verifies that a valid date is received. The minimum format of YYYYMMDD is required. A null/invalid value results in message rejection.

QRD-2 Query/response format code. IRIS requires this field and only accepts a value of 'R'. A null/invalid value results in message rejection.

QRD-3 Time frame in which the response is expected. IRIS requires this field and only accepts a value of 'I'. A null/invalid value results in message rejection.

QRD-4 Unique identifier for the query assigned by the querying application. IRIS requires this field and null/invalid values result in message rejection. This field is returned intact by IRIS in a response (VXR or VXX).

QRD-7 Maximum length of the response that can be accepted by the requesting system. The 1st component is a numerical value, and the 2nd component accepts only the value 'RD' (i.e.`|5^RD|`). A null/invalid value in either sub-

component results in message rejection. IRIS will interpret the units as the maximum number of patient matching records to be returned via a VXX response message.

Note: IRIS will return a maximum of 10 records per query message submitted. The value 0 (zero) or any number 10 or greater will result in the maximum of 10 matches returned by IRIS.

QRD-8 Identifies the subject of the query or whom the inquiry is about. The 2nd component (last name) is required by IRIS. If the last name is missing (regardless if there are repeating full names after the first) it results in message rejection. IRIS supports repetition of this field.

QRD-9 Describes the kind of information required to satisfy the request. IRIS requires this field and a value of 'VXI' must populate the 1st component. IRIS supports repetition of this field. Null/invalid values result in message rejection if the field does not repeat. If the field repeats there must be at least one value of 'VXI' to be valid.

QRD-10 Identifies the 'what' department data code. IRIS requires this field and supports repetition of it. Null/invalid values will result in message rejection.

QRD-11 Further refines the inquiry by data code qualifiers by providing a window or range. This is an optional and repeatable field, and takes the format:

<first data code value (ST)>^<last data code value (ST)>

QRD-12 Used to control level of detail in results. This field is optional and will be populated by IRIS with the total count of PID matches found in IRIS when Query results in a VXX Response Message.

Example:

```
QRD|20120122|R|I|000000001|||25^RD|01^KENNEDY^JOHN^FITZGERALD^JR|VXI^VACC
INE INFORMATION^HL700048|^IRIS||20
```

QRF – Query Filter Segment – (Required by IRIS)

Used with the QRD segment to further refine the content of a query.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	20	ST	R	Y		Where subject filter
5	60	ST	R			Other query subject filter

Field Notes:

QRF-1 Identifies the department, system or subsystem to which the query pertains. IRIS requires this field. A null/invalid value results in message rejection.

QRF-5 This field is used by registries to transmit a search "key". IRIS requires this field and does not support repetition. The 2nd component (patient birth date) is required by IRIS. A null/invalid format results in message rejection. Format is in YYYYMMDD.

The keys within QRF-5 are ordered and separated by the repeat delimiter '~'. If a key has no value, it is left empty with the repeat delimiter holding its place. The order of data keys is as follows:

<patient Social Security Number>~<**patient birth date**>~<patient birth state>~<patient birth registration number>~<patient Medicaid number>~<mother's name last^first^middle>~<mother's maiden name>~<mother's Social Security Number>~<father's name>~<father's Social Security Number>.

Example:

QRF|IRIS||||234567890~**20000607**~IA~IA9999~MA8888~SMITH^JANE^LEE~DOE~234567891~SMITH^JOHN^JO~234567892|

Patient Administration Message Segments

These segments contain information about patients and their associated medical data.

PID – Patient Identification Segment

The PID segment is used by all applications 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.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
3	20	CX	R	Y	0203	Patient Identifier List (Internal ID)
5	48	XPN	R			Patient Name
6	48	XPN	SE			Mother's Maiden Name
7	26	TS	R			Date of Birth
8	1	IS	R		0001	Sex (Gender)
9	48	XPN		Y		Patient Alias Name(s)
10	80	CE		Y	0005	Race
11	106	XAD	SE			Patient Address
13	40	XTN	SE			Phone number – home
22	80	CE		Y	0189	Ethnic Group
24	1	ID			0136	Multiple Birth Indicator
25	2	NM				Birth Order
29	26	TS				Patient Death Date

Field Notes:

PID-3 See Table 0203. Sub-components 1 (ID) and 5 (identifier type code) are required. IRIS supports repetition of this field. A Provider Organization is required to send a Patient Internal ID using one of the following identifier type codes (PI, PN, PRN, or PT). Additional patient identifiers may be sent using repetition of the PID-3 field, including Social Security Number (SS) or Medicaid ID (MA). When IRIS sends to an outside system, the Primary State ID will be sent as the State Registry ID (SR), and the outside system's Primary Patient ID will be sent as the Patient Internal ID (PI) if it is stored in the IRIS.

PID-5 See the XPN data type. Last name and first name are required in the first two components. If the Name Type Code component is included, use L which means Legal. Note: If patient does not have a first name, the value NO FIRST NAME must be entered. IRIS does not support repetition of this field.

PID-6 See the XPN data type. In this context, where the mother's maiden name is used for patient identification, IRIS uses only last name and first name. A mother's legal name might also appear in the context of an NK1 segment. IRIS does not send this data in outgoing data exchange. IRIS does not support repetition of this field. This element is strongly encouraged for assisting in the IRIS run-match process.

PID-7 Give the year, month, and day of birth (YYYYMMDD). IRIS ignores any time component.

PID-8 See Table 0001. Element: Sex (Gender). Use F (Female), M (Male), or U (Unknown).

PID-9 See the XPN data type. IRIS will store Family Name, Given Name, and Middle Name for each Patient Alias name sent - other XPN components will be ignored. If the Patient Alias name is an exact match of the patient's primary name or an existing alias name, it will not be loaded. IRIS supports repetition of this field.

PID-10 See Table 0005. IRIS stores and writes 'Unknown' values as null. IRIS supports repetition of this field.

PID-11 See the XAD data type. IRIS does not support repetition of this field.

PID-13 See the XTN data type. Version 2.3.1 includes the support of the N, X, B and C sequences. IRIS does not support repetition of this field. If PRN is specified in component 2 (telecommunication use code (ID) from Table 0201) IRIS will use the 6th, 7th, 8th, and 9th components for specification of area code, phone number, extension and text, respectively. Otherwise, IRIS will assume that the phone number is specified in the first component in the [NNN] [(999)]999-9999[X99999][B99999][C any text] format.

PID-22 See Table 0189. IRIS stores and writes 'Unknown' values as null. IRIS supports repetition of this field.

PID-24 See Table 0136. Use Y to indicate that the patient was born in a multiple birth.

PID-25 Relevant when patient was born in a multiple birth. Use 1 for the first born, 2 for the second, etc. This field is useful in matching patient data to existing records. Note: You must include Y in PID-24 and indicate the birth order in PID-25 for the birth order to be loaded.

PID-29 The date of death, if patient is deceased. Give the year, month, and day (YYYYMMDD). IRIS ignores any time component. If a death date is sent, then the Patient Registry Status in PD1-16 must indicate a value of 'P' for permanently inactive/deceased.

PD1 – Patient Additional Demographic Segment

The PD1 carries patient additional demographic information that is likely to change.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
11	80	CE	R		0215	Publicity Code
16	1	IS	R		0441	Immunization registry status
17	8	DT	SE			Immunization registry status effective date
18	8	DT	R			Publicity Code effective date

Field Notes:

PD1-11 See Table 0215. Controls whether recall/reminder notices are sent. IRIS will recognize '01' to indicate no recall/reminder notices or '02' recall/reminder notices are allowed to be sent for this patient.

PD1-16 See Table 0441. Identifies the registry status of the patient. If a code of P is specified, the PID-29 segment must be filled in with Patient Death Date or record will be rejected.

PD1-17 Effective date for registry status reported in PD1-16. Format is YYYYMMDD.

PD1-18 Effective date for publicity code reported in PD1-11. Format is YYYYMMDD.

NK1 – Next of Kin/Associated Parties Segment

The NK1 segment contains information about the patient's other related parties. Any associated parties may be identified. Multiple NK1 segments can be sent for a patient account by incrementing the value in NK1-1.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	4	SI	R	Y		Set ID - NK1
2	48	XPN				Name
3	60	CE			0063	Relationship
4	106	XAD				Address
5	40	XTN				Phone Number

Field Notes:

NK1-1 Sequential numbers. Use '1' for the first NK1 within the message, '2' for the second, and so forth. Although this field is required by HL7, IRIS will ignore its value, and there is no requirement that the record for the same responsible person keep the same sequence number across multiple messages, in the case that information from the same record is transmitted more than once.

NK1-2 See the XPN data type. Name of the responsible person who cares for the patient. IRIS does not support repetition of this field.

NK1-3 See CE data type and Table 0063. Relationship of the responsible person to the patient. Use the first three components of the CE data type, for example |MTH^Mother^HL70063|.

NK1-4 See the XAD data type. Responsible person's mailing address. IRIS does not support repetition of this field. If relationship (NK1-3) is MTH (Mother), the Address in this field will become the patient's address.

NK1-5 Responsible person's phone number. IRIS does not support repetition of this field. If PRN is specified in component 2 (telecommunication use code from Table 0201) IRIS will use the 6th 7th 8th and 9th components for specification of area code, phone number, extension and text, respectively. Otherwise, IRIS will assume that the phone number is specified in the first component in the [NNN] [(999)]999-9999[X99999][B99999][C any text] format.

RXA – Pharmacy/Treatment Administration Segment

The RXA carries pharmacy/immunization administration data. It is a repeating segment and can record unlimited numbers of vaccinations. IRIS supports deduction of new immunizations from IRIS inventory as well as the deletion of immunizations from the immunization information system that were added incorrectly.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	4	NM	R			Give Sub-ID Counter
2	4	NM	R			Administration Sub-ID Counter
3	26	TS	R			Date/Time Start of Administration
4	26	TS	R			Date/Time End of Administration
5	100	CE	R			Administered Code
6	20	NM	R			Administered Amount
9	200	CE			NIP001	Administration Notes
10	200	XCN				Administering Provider
11	200	CM	R			Administered-at location
15	20	ST	S/E			Substance Lot Number
17	60	CE	S/E		0227	Substance Manufacturer Name
18	200	CE			NIP002	Substance Refusal Reason
20	2	ID			0322	Completion Status
21	2	ID			0323	Action code-RXA

Field Notes:

RXA-1 Required by HL7. Use '0' for IRIS.

RXA-2 Required by HL7. Use '999' for IRIS. Other numeric values are ignored. IRIS sends out series information in this field, provided the system is configured to do so. For example, if a dose evaluates to (3 of 4) in the Immunization Evaluator, then the system sends the number 3 in RXA-2. If the dose violates a specific Immunization Evaluator rule, then the system sends 777 in RXA-2. In all other cases, the number 999 is sent in RXA-2. For combination vaccines, 999 is always sent in RXA-2, and the series count for each component antigen in the combination vaccine is sent in grouped OBX

segments, which follow the RXA segment. Please see the field notes on OBX-3, OBX-4 and OBX-5.

The ability to send series information in RXA-2 only applies to the local Iowa implementation of HL7 Version 2.3.1, as described in this Specification Document.

The Send Series/Recommend option also displays on the Organization Extract Screen when the user chooses the HL7 2.4 Transaction Format.

If the user configures the system so that it will not send series information, then the system always sends 999 in RXA-2.

In the following example, the dose of Encephalitis is the 3rd dose in the series.

```
RXA|0|3|20120215|20120215|39^Japanese encephalitis^CVX^90735^Japanese
encephalitis^CPT|1.0|||01^^^^^~32851911^IRIS immunization
id^IMM_ID^^^||||||||||
```

RXA-3 Date the vaccine was given. IRIS ignores any time component.

RXA-4 Required by HL7. Ignored by IRIS, which will use the date value in RXA-3.

RXA-5 See the CE data type. Identifies the vaccine administered. IRIS accepts the following vaccine code sets: CVX (CVX Codes), CPT (CPT Codes), WTVN (Vaccine Trade Names), NDC (NDC Codes), and WVGC (Vaccine Group Codes). See IRIS Vaccine Codes PDF or Spreadsheet.

For the CVX code set, provide information in the first triplet (components 1 – 3) of the RXA-5 segment. Provide the identifier (CVX Code) in the first component, text description in the second component (optional), and the name of the coding system 'CVX' in the third component.

CVX example:

```
|09^Td/Tdap^CVX^^^|
```

For all other codes sets, provide information in the second triplet (components 4 – 6) of the RXA-5 segment. Provide the identifier in the fourth component, text description in the fifth component (optional), and the name of coding system in the sixth component.

NDC Code example:

```
|^^^11793-2101-*0^Td/Tdap^NDC|
```

Trade Name (WVTN) example:

```
|^^^Td^Td/Tdap^WVTN|
```

CPT Code example:
```
|^^^90718^Td/Tdap^CPT|
```

Vaccine Group (WVGC) example:
```
|^^^Td/Tdap^Td/Tdap^WVGC|
```

If sending multiple code sets, provide the CVX Code in the first triplet and the alternate code set in the second triplet.

CVX and CPT example:
```
|09^Td/Tdap^CVX^90718^Td/Tdap^CPT|
```

For outgoing data exchange, IRIS sends the CVX Code in the first triplet (components 1 – 3); if it is not available, the first triplet is left empty. In the second triplet (components 4 – 6), the IRIS sends NDC Code if it is stored for the immunization. If NDC Code is not present, the CPT Code is sent, and if CPT Code is not present, vaccine group is sent.

RXA-6 Dose Magnitude is the number of age appropriate doses administered. For example, a dose magnitude of 2 of a pediatric formulation would be adequate for an adult. IRIS and HL7 require this field to contain a value. Currently a value of 1.0 is stored in the IIS regardless of the value sent in the message.

RXA-9 Use '00' to indicate the New Immunization Administered is owned by the sending organization or '01' to indicate Historical Record – Source Unspecified. If the source for a historical record is known, please use values 02 through 07 or 'OU' as described in Table NIP001. For provider organizations set up to deduct from IRIS inventory via data exchange, '00' is mandatory in this field for the dose to be deducted. For outgoing IRIS to Provider Organization processing, data exchange will write out the corresponding immunization id in the second repeating segment.

Example:
```
|01^^^^^~9999999^IRIS immunization id^IMM_ID^^^|
```

RXA-10 Identifies the name of the administering clinician (VEI), ordering authority (OEI), and recorder (REI) of the immunization in IRIS. The recorder is not supported on incoming data transfers and only returns if the immunization is owned by the provider requesting the data. IRIS will use components 2 – 7 to record the names. For incoming loads, it is recommended that license information (LPN, RN, MD) be put in the 5th component so that it processes as the clinician suffix in IRIS.

Example:
```
|^GROBBERTS^DELIA^S^RN^MS^^^^^^^VEI^^~^SHAFFER^TERRENCE^P^MD^DR^^^^^^^OEI
^^|
```

For incoming loads, the system automatically creates clinician records in IRIS if a match is not found.

RXA-11 See CM Data Type. Location vaccine was administered at. If your clinic receives state supplied vaccine and/or participates in the Vaccines for Children program, RXA-11 is required in order for the Inventory Module to deduct from inventory appropriately. If you use the Inventory Module (or plan to) you will need to send this field. Administered-at location will be the provider organization code (Org code) for the clinic that **owns** the data. This will be the same code you send in MSH-4.

RXA-15 Manufacturer's lot number for the vaccine. For provider organizations set up to deduct from IRIS inventory via data exchange, when sending a deduction transaction this is a mandatory field. IRIS does not support repetition of this field.

RXA-17 See Table 0227. Identifies the manufacturer of the vaccine. Use of the external code set MVX is recommended. When using this code system to identify vaccines, the coding system component of the CE field should be valued as 'MVX' rather than 'HL70227'. IRIS does not support repetition of this field.

Example:

```
|AB^Abbott Laboratories^MVX^^^|
```

RXA-18 See Table NIP002. When applicable, this field records the reason the patient refused the vaccine. Any entry in this field indicates that the patient did not take the substance. The vaccine that was offered should be recorded in RXA-5, with the number 0 recorded for the dose number in RXA-2. Do not record contraindications, immunities or reactions in this field. IRIS does not support repetition of this field.

RXA-20 See Table 0322. This field records the value PA for sub potent or partially administered doses. For example, a sub potent dose would be a dose of a vaccine which had been stored improperly, rendering the vaccine ineffective. A partially administered dose refers to the scenario where the patient jumps and the needle breaks or any action that results in an unknown quantity of vaccine entering the patient's system.

RXA-21 See Table 0323. This field provides a method for correcting vaccination information previously transmitted incorrectly. To delete an immunization from IRIS, this field must be populated with '**D**' and the other fields in the RXA should match the original message. Immunizations deducted from IRIS inventory cannot be deleted. An add/update occurs when this field is populated with anything other than '**D**'. If the number of deletions received

through batch exceeds 5% of the total number of immunizations or more than 50 immunizations are marked for deletion, IRIS will reject the file.

Example:

```
RXA|0|999|20060715|20060715|^^^90718^Td^CPT|0|||05^^^^^||^^^208^^^^^^^^^^
^^|||||||||D|
```

Notes on Refusals:

a) IRIS only stores the fact that a refusal of a vaccine occurred, not a specific type of refusal, so all outgoing refusals will be designated as 'PARENTAL REFUSAL.' Please see the example below.

b) IRIS will not write out refusals which do not have an applies-to date. It will write out multiple refusals for the same vaccine on different dates for those patients who have them.

c) The IRIS system will accept incoming refusals of the same vaccine on different dates and file them both. However, if they both have the same applies-to date, only one will be stored.

d) The sending organization will become the refusal owner. In general, only the organization who owns the refusal is permitted to edit it. However, in the case of parent and child organizations, the parent may edit the child's refusals and vice versa.

Example:

```
RXA|0|0|20120401|20120401|^^^MMR^MMR^WVGC|1.0|||||||||||00^PARENTAL
REFUSAL^NIP002^^^
```

This segment indicates an MMR refusal on the date 04/01/2012

RXR – Pharmacy/Treatment Route Segment

The RXR Segment contains the alternative combination of route and site.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	60	CE	R	R	0162	Give Sub-ID Counter
2	60	CE	R		0163	Administration Sub-ID Counter

Field Notes:

RXR-1 See Table 0162. This is the route of administration.

RXR-2 See Table 0163. This is the site of administration.

OBX – Observation/Result Segment

The OBX segment is used to transmit an observation. In IRIS, it is primarily used in reference to a preceding RXA segment.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	4	SI				Set ID – OBX Value
2	3	ID				Value type
3	80	CE	R		NIP003	Observation Identifier
4	20	ST				Observation Sub-ID
5	65536	-	SE	Y		Observation Value
11	1	ID	R		0085	Observation Result Status
14	26	TS				Date/Time of the observation

Field Notes:

OBX-1 Sequential numbers. Use '1' for the first OBX within the message, '2' for the second, and so forth.

OBX-2 This field contains the data type which defines the format of the observation value in OBX-5. For Provider to IRIS data transfer, use 'CE' for Coded Entry. For IRIS to Provider data transfer, IRIS will send values of CE, TS, NM for Coded Entry, Timestamp, and Number respectively, depending on what is sent in OBX-5.

OBX-3 See Table NIP003. Identifies the general category of an observation. See OBX Examples listed after the OBX Field Notes for how the OBX segment is utilized in IRIS.

OBX-4 For sending out Series Information and Recommendations, the number in this field groups together related OBX segments. For example, a single recommendation for DTP/aP is sent in a grouped set of five OBX segments, all with the same sub-identifier in OBX-4. The sub-identifier increments sequentially.

IRIS sends out five grouped OBX segments for each recommendation. The following is a single MMR recommendation, the second for this message, and so all share the same Observation sub-ID of 2 in OBX-4.

Example:

```
OBX|6|CE|30979-9^Vaccines Due
Next^LN^^^|2|03^MMR^CVX^90707^MMR^CPT||||||F|
OBX|7|TS|30979-9&30980-7^Date Vaccine Due^LN^^^|2|20130407||||||F|
OBX|8|NM|30979-9&30973-2^Vaccine due next dose number^LN^^^|2|2||||||F|
OBX|9|TS|30979-9&30981-5^Earliest date to give^LN^^^|2|20121105||||||F|
OBX|10|CE|30979-9&30982-3^Reason applied by forecast logic to project
this vaccine^LN^^^|2|^ACIP schedule||||||F|
```

OBX-5 The field identifies the specific value observed. IRIS has imposed a CE data type upon this field; the first component of which is required. The value corresponds to the LOINC code identified in OBX-3.

Example:

```
OBX|6|CE|30979-9^Vaccines Due Next^LN^^^|2|85^HepA, NOS^CVX^90634^HepA,
NOS^CPT||||||F|
OBX|7|TS|30979-9&30980-7^Date Vaccine Due^LN^^^|2|20111212||||||F|
OBX|8|NM|30979-9&30973-2^Vaccine due next dose number^LN^^^|2|1||||||F|
OBX|9|TS|30979-9&30981-5^Earliest date to give^LN^^^|2|20111212||||||F|
OBX|10|CE|30979-9&30982-3^Reason applied by forecast logic to project
this vaccine^LN^^^|2|^ACIP schedule||||||F|
```

Reading this example tells the provider that the next dose of HepA is due on December 12, 2011 and that the dose is the first dose in the series. We can also see that the earliest date that this can be administered is December 12, 2011.

OBX-11 See Table 0085. Required for HL7. Use 'F' for IRIS.

OBX-14 Records the time of the observation. IRIS ignores any time component.

OBX Examples:

Example 1: Vaccination Contraindication/Precaution

When indicating a Vaccination Contraindication/Precaution, enter LOINC code 30945-0 (Table NIP003) in the OBX-3 field, and enter a Contraindication, Precaution, or Immunity code (Table NIP004) in the OBX-5 field.

```
OBX|1|CE|30945-0^Contraindication^LN|40^Thrombocytopenia^NIP^^^|||||||F
```

NOTE 1: The only valid OBX Observation Identifier (OBX-03) for an ADT message is Contraindication/Precaution (30945-0), as they are not specific to an immunization event.

NOTE 2: All OBX messages with an observation identifier of Vaccination Contraindication/Precaution will be returned in an outgoing file in a separate ADT^A31 message for the patient. Current exception is that a VXQ returns only a VXR and therefore the ADT message which contains the contraindication/precautions is not returned.

Example 2: Reaction to Immunization

When indicating a Reaction to Immunization, enter LOINC code 31044-1 (Table NIP003) in the OBX-3 field, and enter a Reaction code (Table IA001) in the OBX-5 field.

```
OBX|1|CE|31044-1^Reaction^LN|12^Seizure occurring within 3 days^IRIS^^^|||||||F
```

Example 3: Vaccination Adverse Event Outcome
When indicating a Vaccination Adverse Event Outcome, enter LOINC code 30949-2 (Table NIP003) in the OBX-3 field, and enter an Event Consequence code (NIP005) in the OBX-5 field.

```
OBX|1|CE|30949-2^Adverse Outcome^LN|L^Life threatening illness^NIP^^^|||||||F
```

Example 4: Vaccine Eligibility Code
When indicating a Vaccine Eligibility Code, enter LOINC code 30963-3 (Table NIP003) in the OBX-3 field, and enter a Vaccine Eligibility Code (IA002) in the OBX-5 field.

```
OBX|1|CE|30963-3^Vaccine purchased with^LN^^^||V03^No Insurance^IRIS||||||F
```

NOTE: Vaccine Eligibility Code is required for Vaccines for Children (VFC) participating clinics. The IRIS collects vaccine eligibility code by dose in the OBX segment; this varies from the CDC 2.3.1 implementation guide where data are gathered both at the patient and funding source level. The IRIS requires this information at the dose level to support both billable projects and future accountability and interface requirements for vaccine ordering, distribution and inventory.

Example 5: Vaccine Funding Type
When indicating a Vaccine Funding Type, enter LOINC code 30963-3 (Table NIP003) in the OBX-3 field, and enter a Vaccine Eligibility Code (NIP008) in the OBX-5 field.

```
OBX|1|CE|30963-3^Vaccine purchased with^LN^^^||PBF^PUBLIC Funds^NIP008||||||F
```

NOTE: Vaccine Funding Type is required for proper inventory deduction when using the IRIS inventory module.

Example 6: Use of OBX to send Series information for vaccines
IRIS uses the OBX segment to send Series information for vaccines. For each vaccine, the system sends out a grouped set of two OBX segments.

The OBX-3 field is used to send LOINC Codes, which identify the component antigen and the series dose number respectively. The LOINC itself is sent in OBX-3 in order to identify what the value in OBX-5 represents. The following table displays the LOINC Codes that the system sends in OBX-3 for Series information.

LOINC Code	Description
38890-0	Component Vaccine Type. This term is used to distinguish separate vaccine components of a multiple antigen vaccine. Included in LOINC 1/2005.
38890-0&30973-2	Dose Number in Series

In the following example, the LOINC Codes are displayed in OBX-3. These two OBX segments together express that the dose number is the 1st dose of the DTaP series.

```
OBX|1|CE|38890-0^COMPONENT VACCINE TYPE^LN|1|20^DTaP^CVX^90700^DTaP^CPT||||||F|
OBX|2|NM|38890-0&30973-2^Dose number in series^LN|1|1||||||F|
```

For each component of a combination vaccine, the system sends out a grouped set of two OBX segments because each component may have a different series dose number. For example, a single dose of DTaP-Hib is sent as below. The first and second OBX segments express the dose number of 1 for DTaP. The third and fourth OBX segments express the dose number of 3 for Hib. Field OBX-4 is the sub-id which ties each grouping of two OBX segments into one entry.

```
RXA|0|999|19810807|19810807|50^DtaP-Hib^CVX^90721^DtaP-
Hib^CPT|1.0|||01^^^^^~32851914^IRIS immunization id^IMM_ID^^^||||||||||||
OBX|1|CE|38890-0^COMPONENT VACCINE TYPE^LN|1|20^DTaP^CVX^90700^DTaP^CPT||||||F|
OBX|2|NM|38890-0&30973-2^Dose number in series^LN|1|1||||||F|
OBX|3|CE|38890-0^COMPONENT VACCINE TYPE^LN|2|17^Hib^CVX^90737^Hib^CPT||||||F|
OBX|4|NM|38890-0&30973-2^Dose number in series^LN|2|3||||||F|
```

Example 7: Use of OBX to send Recommendation information for a vaccine series

IRIS uses the OBX segment to send recommendation information for a vaccine series. For each recommendation, the system sends a grouped set of five OBX segments, which follow a place-holder RXA segment that does not represent an actual immunization administered to the patient. The five OBX segments in order express the recommended vaccine, the recommended date, the dose of the next vaccine due, the earliest date to give, and the reason for the recommendation, which is always the ACIP schedule.

The OBX-3 field is used to send LOINC Codes, which identify the five components of the Recommendation. The LOINC itself is sent in OBX-3 in order to identify what the value in OBX-5 represents. The following table displays the LOINC Codes that the system sends in OBX-3 for Recommendations.

LOINC Code	Description
30979-9	Vaccines Due Next
30979-9&30980-7	Date Vaccine Due
30979-9&30973-2	Vaccine due next dose number
30979-9&30981-5	Earliest date to give
30979-9&30982-3	Reason applied by forecast logic to project this vaccine

In the following example, the LOINC Codes are displayed in OBX-3 for a recommendation of DTaP/aP, HepA, and HepB.

```
RXA|0|0|20120407|20120407|998^No Vaccine Administered^CVX|999|0
OBX|1|CE|30979-9^Vaccines Due
Next^LN^^^|1|20^DTP/aP^CVX^90700^DTP/aP^CPT||||||F|
OBX|2|TS|30979-9&30980-7^Date Vaccine Due^LN^^^|1|20120707||||||F|
```

```
OBX|3|NM|30979-9&30973-2^Vaccine due next dose number^LN^^^|1|1||||||F|
OBX|4|TS|30979-9&30981-5^Earliest date to give^LN^^^|1|20120707||||||F|
OBX|5|CE|30979-9&30982-3^Reason applied by forecast logic to project this
vaccine^LN^^^|1|^ACIP schedule||||||F|
OBX|6|CE|30979-9^Vaccines Due Next^LN^^^|2|85^HepA^CVX^90730^HepA^CPT||||||F|
OBX|7|TS|30979-9&30980-7^Date Vaccine Due^LN^^^|2|20130407||||||F|
OBX|8|NM|30979-9&30973-2^Vaccine due next dose number^LN^^^|2|1||||||F|
OBX|9|TS|30979-9&30981-5^Earliest date to give^LN^^^|2|20130407||||||F|
OBX|10|CE|30979-9&30982-3^Reason applied by forecast logic to project this
vaccine^LN^^^|2|^ACIP schedule||||||F|
OBX|11|CE|30979-9^Vaccines Due Next^LN^^^|3|45^HepB^CVX^90731^HepB^CPT||||||F|
OBX|12|TS|30979-9&30980-7^Date Vaccine Due^LN^^^|3|20120707||||||F|
OBX|13|NM|30979-9&30973-2^Vaccine due next dose number^LN^^^|3|1||||||F|
OBX|14|TS|30979-9&30981-5^Earliest date to give^LN^^^|3|20120707||||||F|
OBX|15|CE|30979-9&30982-3^Reason applied by forecast logic to project this
vaccine^LN^^^|3|^ACIP schedule||||||F|
```

The ability to receive recommendation information in these grouped OBX segments applies to bi-directional data exchange.

For batch processing, if the user configures the system so that it will not send recommendations, the system will omit sending the grouped set of five OBX segments entirely. When sending a VXQ (Vaccination Query) message the system will return a VXR response with the recommendations, regardless of how data exchange is configured.

HL7 Message Examples

To illustrate how a IRIS HL7 file is put together we will document how the fictional organization, Valley Clinic, formats patient and immunization records to be transmitted to IRIS. The following table displays the information to be transmitted and it is organized into HL7 segments and fields. For example, PID-3 refers to the third field in the Patient Identification segment.

Patient #1 (George Miller)		
Information Type	**Value to Transmit**	**HL7 Field**
	PID Segment	
Chart Number	45LR999 (ID on Valley Clinic's system)	PID-3
Name	GEORGE M MILLER JR	PID-5
Mother's Maiden Name	MARTHA OLSON	PID-6
Birth date	February 27, 2005 (send as 20050227)	PID-7
Sex	M	PID-8
Address	123 MAIN, DES MOINES, IA 50340, 1843	PID-11
Birth Place	BUTLER COUNTY (send as IA023), IA	PID-23
Multiple Birth Indicator	Y (born as part of a multiple birth)	PID-24
Birth Order	2 (second birth of a multiple birth)	PID-25
	PD1 Segment	
Publicity Code	02 (reminder/recall – any method)	PD1-11
Patient Registry Status	A (patient is active in the immunization information system)	PD1-14
	NK1 Segment	
Responsible Person Name #1	MARTHA MILLER	NK1-2
Relationship to patient	MTH	NK1-3
Address	123 MAIN, DES MOINES, IA 50340, 1843	NK1-4
Phone	555 123 4567	NK1-5
Responsible Person Name #1	GEORGE MILLER	NK1-2
Relationship to patient	FTH	NK1-3
Patient #2 (Maria Califano)		
Information Type	**Value to Transmit**	**HL7 Field**
	PID Segment	
IRIS ID	23LK729	PID-3
Name	MARIA CALIFANO	PID-5
Mother's Maiden Name	ANGELICA DISTEFANO	PID-6
Birth Date	April 13, 2008 (send as 20080413)	PID-7
Sex	F	PID-8
	RXA Segment #1	
Date Administered	July 23, 2009 (send as 20090723)	RXA-3
CPT Code	90700 (DTaP)	RXA-5

Dose size	0.5	RXA-6
Administering Provider Organization	Valley Clinic (send provider org code: AL9999)	RXA-11
RXA Segment #2		
Date Administered	July 23,2009 (send as 20090723)	RXA-3
CPT Code	90707 (MMR)	RXA-5
Dose size	0.5	RXA-6
Administering Provider Organization	Valley Clinic (send provider org code AL9999)	RXA-11
Patient #3 (Joseph Fischer)		
Information Type	**Value to Transmit**	**HL7 Field**
PID Segment		
IRIS ID	92HG9257	PID-3
Name	JOSEPH FISHER	PID-5
Mother's Maiden Name	MARY LASOWSKI	PID-6
Birth date	May 28, 2008 (send as 20080528)	PID-7
Sex	M	PID-8
RXA Segment #1		
Date Administered	July 29, 2009 (send as 20090729)	RXA-3
CPT Code	90707 (MMR)	RXA-5
Dose	0.5	RXA-6
Administering Provider Organization	Valley Clinic (send provider org code AL9999)	RXA-11
Lot Number	AD19487	RXA-15
Lot Expiration Date	December 12, 2009 (send as 20091212)	RXA-16
Lot Manufacturer	FLYBYNIGHT LABORATORIES (this manufacturer is not found in the valid list in HL7 Table 0227. The message will still be accepted in IRIS, with the manufacturer set to unknown.)	RXA-17

In an HL7 message, each segment is a single text line, ending with the carriage return character. In the examples, long lines are broken artificially for display purposes and the carriage return character is denoted by <CR>.

Message for Patient #1

```
MSH|^~\&||VALCLIN^AL9999||IRIS|20120415091520||VXU^V04|00000123|P|2.4|||AL<CR>
PID|||45LR999^^^^PI||MILLER^GEORGE^M^JR|OLSON^MARTHA|20050227|M|||123 MAIN
ST^^ALLERTON^IA^50000^US^^^FULTON||||||||000111222||||US^OR^1843|Y|2<CR>
PD1||||||||||||02^REMINDER/RECALL - ANY MENTOD^HL70215 A<CR>
NK1|1|MILLER^MARTHA|MTH^Mother^HL70063|123 MAIN ST^^DES
MOINES^IA^50340^US^^^1843|(555)123-4567<CR>
NK1|2|MILLER^GEORGE|FTH^Father^HL70063<CR>
```

Message for Patient #2

```
MSH|^~\&||VALCLIN^AL9999||IRIS|20120415091520||VXU^04|00000124|P|2.4|||ER<CR>
PID|||66782^^^SR^~23LK729^^^^PI|CALIFANO^MARIA|DISTEFANO^ANGELICA|20080413|F<CR
>
RXA|0|999|20090723|20090723|^^^90700^DTaP^CPT|0.5||||AL9999<CR>
RXA|0|999|20090723|20090723|^^^90707^MMR^CPT|0.5||||AL9999<CR>
```

Message for Patient #3

```
MSH|^~\&||VALCLIN^AL9999||IRIS|20120415091520||VXU^04|00000125|P|2.4|||ER<CR>
PID|||927389^^^^SR^~92HG9257^^^^PI|FISHER^JOSEPH|LASOWSKI^MARY|20080528|M<CR>
RXA|0|999|20090729|20090729|^^^90707^MMR^CPT|0.5||||VALCLIN|||||AD19487|2009121
2|ZZ^FLYBYNIGHT LABORATORIES^MVX|||||A<CR>
```

In the example above, Valley Clinic sends three HL7 messages to IRIS.

Patient George M Miller Jr. is identified by Valley Clinic's Patient ID, 45LR999, in his PID segment. The message could have included George's IRIS ID number in field PID-3, but does not have to, if it is not recorded in Valley Clinic's system. George's mother's maiden name, his birth date, sex, and address also serve to identify him. Some other optional fields are not present, including some fields from the full HL7 standard not defined in this document because they are not used by IRIS. Fields not present do not diminish the number of '|' delimiters, so later fields can be identified by ordinal position in the segment. Two NK1 segments give some information for George's mother and father, just the minimum required for his father, with address and telephone fields for his mother.

The next two PID segments in the second and third messages give an IRIS patient ID in field PID-3. This must have been transmitted earlier from IRIS to Valley Clinic's system. In this case it is legitimate to omit more of the optional PID fields, since IRIS must have at least the minimum required information for these patients even to create a record. However, if there is a possibility that Valley Clinic has new or changed information to send to IRIS, these fields should be present, and it does no harm to repeat fields even if they have been transmitted previously.

ACK for Patient #1

```
MSH|^~\&|IRIS|IRIS||AL9999|20120415091530||ACK|00000456|P|2.4<CR>
MSA|AA|00000123<CR>
```

ACK for Patient #2

None returned

ACK for Patient #3

```
MSH|^~\&|IRIS|IRIS||AL9999|20120415091530||ACK|00000458|P|2.4<CR>
MSA|AE|00000125|INVALID MANUFACTURER CODE<CR>
ERR|RXA^152^17^1<CR>
```

IRIS responds to new messages with ACK messages of its own. Valley Clinic's message 00000123 (for patient #1) had the value AL in field MSH-15, asking for acknowledgements

of all messages. The value AA in MSA-1 indicates that this message was processed without error.

The next message, 00000124 (Patient #2), uses the value ER to ask for acknowledgement only in case of errors, so this message is acknowledged implicitly by the absence of an ACK message for it. This example is for purposes of illustration as some providers may prefer to receive error acknowledgements only.

The last message, 00000125 (Patient #3), did contain an error, and the ERR segment in its acknowledgement indicates the segment ID (RXA) of the segment, the line number (152) where it appears in the input file, the errant field (17)and the field component (1). The MSA segment contains the error message. Errors will be generated for missing required data, invalid data or any other deviance from the form and content of messages as specified in this document.

In the sample file exchanges above, the outside system initiated the exchange with a series of VXU messages and IRIS responded with ACK segments. IRIS always sends its own patient identifier in the required field PID-03 and includes the outside system‘s identifier in PID-03 if known. Outside systems are encouraged to store IRIS‘s patient ID, and use it in PID-03 when sending to IRIS. This provides a firm basis for patient identification makes processing easier for the IRIS system and avoids errors in storing patient information, such as creation of duplicate records when an insufficiently identified patient record cannot be matched with a record already in the IRIS database. Though IRIS makes a great effort to match patient records effectively, use of the IRIS patient ID is the best guarantee of clean and useful data.

Data Exchange Specifications for IRIS

The central repository of IRIS contains records of patients from around the state. Patient and immunization records flow both ways between IRIS and outside systems. Data, for a particular patient, is transmitted by IRIS to an outside system (Provider Organization) only if the patient is identified as having an active relationship with that organization AND the relationship was created either by transmitting the patient's record to IRIS, or by creating the relationship via the IRIS web interface. So, an exchange of information about a given patient is always initiated by the outside system.

There are three options for exchanging data with IRIS:

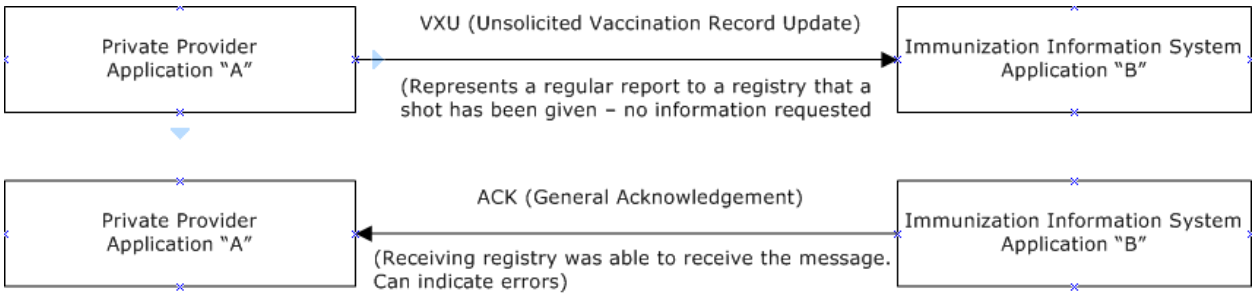
(1) The Provider Organization can send data to IRIS and request that no data is returned from IRIS, which is a Provider Organization to IRIS data transfer.

(2) The Provider Organization can request data from IRIS while not providing data to IRIS, which is a IRIS to Provider Organization data transfer.

(3) The Provider Organization can send data to IRIS and IRIS will return any updated information regarding any patients that have an Active relationship with that Provider Organization, which is a Bi-directional data transfer.

HL7 messages are always part of a two-way exchange between an initiating system and a responder. Sometimes the initial message implies specific data to be sent in a response. Other times, as is the case with IRIS patient and immunization data, the principal response of the responder is to process the message and post whatever it contains to its own database. For these cases, the responder provides the ACK message type in an HL7 format, which contains no new application data, but allows the receiver to inform the initiator that the message has been received and processed successfully. If an error prevents successful processing, optional parts of the ACK message will allow this to be communicated as well.

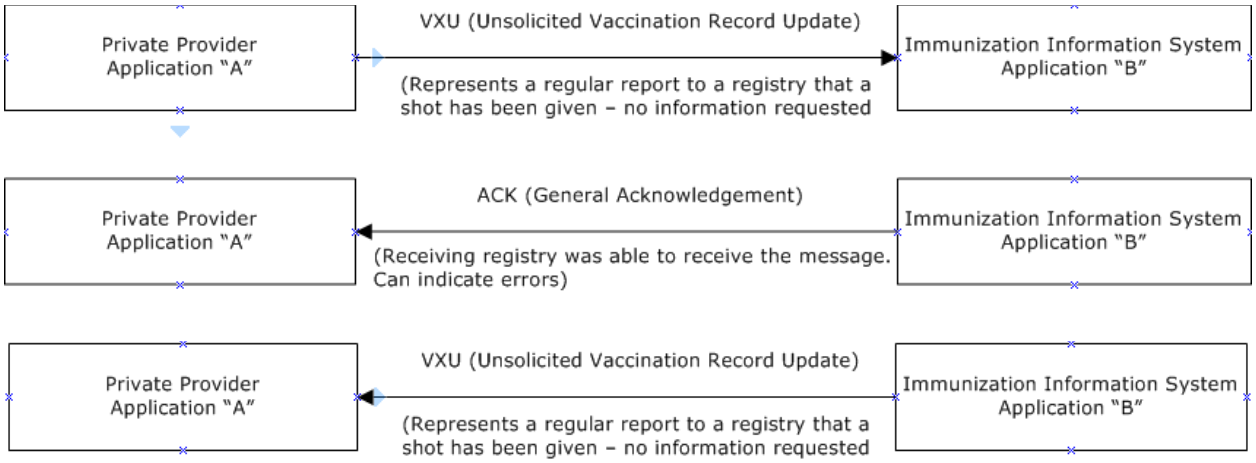
For single-direction exchanges between IRIS and outside systems, it is the responsibility of the outside system to initiate the transfer of the first file. This file contains either ADT (only for updating demographic information) and/or VXU (patient and immunization data) messages with patient and immunization data for adding or updating the IRIS registry. After processing those messages, IRIS responds with a response file of ACK messages.



This transmission of data to IRIS will follow the pattern below:

	Provider Organization	**IRIS**
1.	Creates a file of patient and immunization records that are new or have changed since they were last transmitted to IRIS.	
2.	Transmits the file to IRIS.	
3.		Processes the file received and creates a file of ACK messages.
4.		Posts the ACK file for the initiator to pick up via the web-interface.
5.	Processes the ACK file to confirm success of the file transmission.	

For Bi-directional exchanges between IRIS and outside systems, it is again the responsibility of the outside system to initiate the transfer of the first file, containing either ADT and/or VXU messages. After processing those messages, IRIS responds with a response file of ACK messages. At the same time or soon after, IRIS also creates another file of ADT and VXU messages, containing the full patient record (if the patient was new), to send to the Provider Organization that initiated the first transfer. It is the responsibility of the Provider Organization as receiver to transmit back a file of ACK messages.



This exchange of data to IRIS is detailed below.

	Provider Organization	**IRIS**
1.	Creates a file of patient and immunization records that are new or have changed since they were last transmitted to IRIS.	
2.	Transmits the file to IRIS.	
3.		Processes the file received, creates a file of ACK messages.
4.		Creates a file of any active patient and immunization records that have changed since they were last transmitted to this Provider Organization.
5.		Posts the file of patient and immunization records that have changed since they were last transmitted to this Provider Organization to pick up via the web-interface.
6.	Processes the ACK file to confirm success of the file transmission.	
7.	Processes the file of patient and immunization records that have changed since they were last transmitted to this Provider Organization.	
8.	Processes the file received, creates a file of ACK messages.	
9.	Transmits the ACK file to IRIS.	
10.		Processes the ACK file to confirm success of the file transmission.

The 15th field in the MSH message header segment (MSH-15) allows the initiator to ask that the message be acknowledged only in the case of an error. IRIS supports this in order to minimize the number of ACK messages transmitted. In this case, the ACK file contains only error messages (an optional form of the ACK message type). The original messages, with no answering error messages, are implicitly acknowledged as successfully processed. If all messages in a batch are successful, the answering ACK file will only contain file batch headers and footers, with no actual ACK messages.

For Step 2 in the above table, it is permissible for a Provider Organization to send a file containing only file batch headers and footers as a way of triggering the file that IRIS creates in Step 5.

It is also possible that the file IRIS creates in Step 5 will contain only file batch headers and footers if there are no records to send.

Data Exchange Frequency: Real-time & Batch

Regardless of whether you send in real-time or batch, the format and content of your HL7 messages and what is returned to you from the IIS will be essentially the same. (See section 1 of this guide for information on HL7 messages.)

Real Time Transfer

IRIS can accept and transmit the HL7 real time messaging for submitting patient and immunization information to IRIS.

"Real time" processing with IRIS refers to the ability to transmit an HL7 VXQ^V01 Message (Query for Vaccination Record) and a VXU^V04 Message (Unsolicited Vaccination Update) and receive from IRIS the resulting HL7 Response Message. A provider organization will query the immunization information system to get information on a certain patient (i.e. send an HL7 2.4 VXQ^V01 message) and will receive an HL7 Message Response (i.e. VXR^V03, VXX^V02, ACK or QAK) to that query in real time.

If you are sending through SOAP Web Services, messages are processed one at a time.

Batch Transfer

The definitions above tell how to create messages containing patient and immunization data. Each message can logically stand on its own and HL7 is compatible with various methods of real-time and batch transmission. Sending files by batch permits many messages to be sent together. Batch header and footer segments are not part of any message, but serve to bracket the messages defined above. (NOTE: Batch Message Headers (i.e. FHS, BHS) and footers (i.e. FTS, BTS) are NOT allowed for real time processing.) The structure of a batch file is as follows.

```
[FHS]                 (file header segment)
  {[BHS]                    (batch header segment)
    {[MSH                       (zero or more HL7 messages)
      …]}                       (message content)
  [BTS]}                    (batch trailer segment)
[FTS]                 (file trailer segment)
```

FHS – File Header Segment

The FHS segment is used to head a file (group of batches).

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	1	ST	R	Y		File Field Separator
2	4	ST	R			File Encoding Characters
3	15	ST				File Sending Application
4	20	ST	SE			File Sending Facility
6	20	ST				File Receiving Facility
7	26	TS				File Creation Date/Time
9	20	ST				File Name/ID

10	80	ST				File Header Comment
11	20	ST				File Control ID
12	20	ST				Reference File Control ID

Field Notes:

FHS-1 Same definition as the corresponding field in the MSH segment.

FHS-2 Same definition as the corresponding field in the MSH segment.

FHS-3 Same definition as the corresponding field in the MSH segment.

FHS-4 Same definition as the corresponding field in the MSH segment.

FHS-6 Same definition as the corresponding field in the MSH segment.

FHS-7 Same definition as the corresponding field in the MSH segment.

FHS-9 Same definition as the corresponding field in the MSH segment.

FHS-10 Free text, which may be included for convenience, but has no effect on processing.

FHS-11 This field is used to identify a particular file uniquely among all files sent from the sending facility identified in FHS-4.

FHS-12 Contains the value of FHS-11-file control ID when this file was originally transmitted. Not present if this file is being transmitted for the first time.

FTS - File Trailer Segment

The FTS segment defines the end of a file.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	10	NM				File Batch Count
2	80	ST				File Trailer Comment

Field Notes:

FTS-1 The number of batches contained in this file. IRIS normally sends one batch per file and discourages sending multiple batches per file.

FTS-2 Free text, which may be included for convenience, but has no effect on processing.

BHS – Batch Header Segment

The BHS segment defines the start of a batch.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME
1	1	ST	R	Y		Batch Field Separator
2	4	ST	R			Batch Encoding Characters
3	15	ST				Batch Sending Application
4	20	ST	SE			Batch Sending Facility
6	20	ST				Batch Receiving Facility
7	26	TS				Batch Creation Date/Time
10	80	ST				Batch Comment
11	20	ST				Batch Control ID
12	20	ST				Reference Batch Control ID

Field Notes:

BHS-1 This field contains the separator between the segment ID and the first real field, BHS-2 (batch encoding characters). As such, it serves as the separator and defines the character to be used as a separator for the rest of the segment. IRIS requires '|' (ASCII 124).

BHS-2 Same definition as the corresponding field in the MSH segment.

BHS-3 Same definition as the corresponding field in the MSH segment.

BHS-4 Same definition as the corresponding field in the MSH segment.

BHS-6 Same definition as the corresponding field in the MSH segment.

BHS-7 Same definition as the corresponding field in the MSH segment.

BHS-10 Free text, which may be included for convenience, but has no effect on processing.

BHS-11 This field is used to uniquely identify a particular batch. It can be echoed back in BHS-12 (reference batch control ID) if an answering batch is needed. For IRIS purposes, the answering batch will contain ACK messages.

BHS-12 This field contains the value of BHS-11-batch control ID when this batch was originally transmitted. Not present if this batch is being sent for the first time. See definition for BHS-11-batch control ID.

BTS – Batch Trailer Segment

The BTS segment defines the end of a batch.

SEQ	LEN	DT	R/SE	RP/#	TBL#	ELEMENT NAME

1	10	NM				Batch Message Count
2	80	ST				Batch Comment

Field Notes:

BTS-1 This field contains the count of the individual messages contained within the batch.

BTS-2 Free text, which can be included for convenience, but has no effect on processing.

HL7 Message Transport Methods

The preferred method for sending immunization update and query messages is HL7 real-time via the SOAP web service. Other options are HL7 batch files which can be uploaded to IRIS User Interface or by sending to the IRIS SFTP site.

Please contact the IRIS Help Desk if you are interested in setting up electronic data exchange with IRIS or if you are interested in enhancing the way you currently submit data to IRIS.

Appendix A -- HL7 Data Types

The following descriptions of HL7 data types are excerpted or adapted from the HL7 standard. See the field notes within each segment definition above on how to use data types in particular fields. Some data types have complex definitions much of which do not apply to IRIS usage, and for these we omit much of the HL7 definition of the data type, referring instead to the field notes in the segment definitions.

CE - Coded Element

This data type transmits codes and the text associated with the code. To allow all six components of a CE data type to be valued, the maximum length of this data type must be at least 60. The components included in the CE data type are always as follows:

> <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier(ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (ST)>

These components are defined as follows:

> Identifier (ST): Sequence of characters (the code) that uniquely identifies the item being referenced by the <text>. Different coding schemes will have different elements here.
>
> Text (ST): Name or description of the item in question. E.g., myocardial infarction or X-ray impression. Its data type is string (ST).
>
> Name of coding system (ST): Each coding system is assigned a unique identifier. This component will serve to identify the coding scheme being used in the identifier component. The combination of the identifier and name of coding system components will be a unique code for a data item. Each system has a unique identifier. The various systems currently used by IRIS are located in the tables section of this document. Others may be added as needed. When an HL7 table is used for a CE data type, the name of coding system component is defined as HL7NNNN where NNNN is the HL7 table number.
>
> Alternate components: These three components are defined analogously to the above for the alternate or local coding system. If the Alternate Text component is absent, and the Alternate Identifier is present, the Alternate Text will be taken to be the same as the Text component. If the Alternate Coding System component is absent, it will be taken to mean the locally defined system.
>
> Example:
> `|F-11380^CREATININE^I9^2148-5^CREATININE^LN`

Note: The presence of two sets of equivalent codes in this data type is semantically different from a repetition of a CE-type field. With repetition, several distinct codes (with distinct meanings) may be transmitted.

Note: For HL7-defined tables which have not been adopted from some existing standard, the third component, "name of coding system," is constructed by appending the table number to the string "HL7." Thus, the field RXR-2-site, is a CE data type which refers to HL7 table number 0163. Its "name of coding system" component is "HL70163".

CM - Composite

This data type is a combination of other meaningful fields. The complete format is as follows:

> <point of care (IS)> ^ <room (IS) ^ <bed (IS)> ^ <facility (HD) ^ <location status (IS) ^<patient location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ < street address (ST)> ^<other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip or postal code(ST)> ^ <country (ID)> ^ <address type (ID)> ^ <other geographic designation (ST)>Subcomponents of facility (HD): <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
>
> Example:
> `|^^^Valley Clinic|`

Note that IRIS disregards most of these components except those indicating facility and address.

CX - Extended Composite ID with Check Digit

IRIS uses this data type only for patient identification in Patient Identification (PID) segments. See the field notes for values used for IRIS.

HD - Hierarchic Designator

IRIS uses this data type only to identify sender and receiver in Message Header (MSH) segments. See the field notes for values used for IRIS.

ID - Coded Value for HL7 Defined Tables

The value of such a field follows the formatting rules for a ST field, except that it is drawn from a table of legal values. There is always a specific HL7 table number associated with the ID data type. Examples of ID fields include religion and sex.

IS - Coded Value for User Defined Tables

The value of such a field follows the formatting rules for a ST field except that it is drawn from a site-defined (or user-defined) table of legal values. There is always a specific table number associated with the IS data type. An example of an IS field is the Event reason code defined in Section 3.3.1.4 [of the full HL7 standard], "Event reason code."

NM - Numeric

A number represented as a series of ASCII numeric characters consisting of an optional leading sign (+ or -), the digits and an optional decimal point. In the absence of a sign, the number is assumed to be positive. If there is no decimal point the number is assumed to be an integer.

Examples:

```
|999|
|-123.792|
```

Leading zeros, or trailing zeros after a decimal point, are not significant. For example, the following two values with different representations, "01.20" and "1.2", are identical. Except for the optional leading sign (+ or -) and the optional decimal point (.), no non-numeric ASCII characters are allowed. Thus, the value <12 should be encoded as a structured numeric (SN) (preferred) or as a string (ST) (allowed, but not preferred) data type.

SI - Sequence ID

A non-negative integer in the form of a NM data type. See the field notes in segments using this data type for specifications of SI fields.

ST - String Data

This data format is used for unfiltered text. String data is left justified with trailing blanks optional. Any displayable (printable) ACSII characters can be used (hexadecimal values between 20 and 7E, inclusive, or ASCII decimal values between 32 and 126), except the defined delimiter characters.

Example:

```
|almost any data at all 123 @?$|
```

To include any HL7 delimiter character (except the segment terminator) within a string data field, use the appropriate HL7 escape sequence.

Usage note: the ST data type is intended for short strings (e.g., less than 200 characters). For longer strings the TX or FT data types should be used.

TS - Time Stamp

This data format contains the exact time of an event, including the date and time. The date portion of a time stamp follows the rules of a date field and the time portion follows the rules of a time field. The specific data representations used in the HL7 encoding rules are compatible with ISO 8824-1987(E).

Format: YYYY[MM[DD[HHMM[SS[.S[S[S[S]]]]]]]][+/-ZZZZ]^<degree of precision>

In prior versions of HL7, an optional second component indicates the degree of precision of the time stamp (Y = year, L = month, D = day, H = hour, M = minute, S = second). This optional second component is retained only for purposes of backward compatibility.

By site-specific agreement, YYYYMMDD[HHMM[SS[.S[S[S[S]]]]]][+/-ZZZZ]^<degree of precision> may be used where backward compatibility must be maintained.

In the current and future versions of HL7, the precision is indicated by limiting the number of digits used, unless the optional second component is present. Thus, YYYY is used to

specify a precision of 'year,' YYYYMM specifies a precision of 'month,' YYYYMMDD specifies a precision of 'day, and so forth. In each of these cases, the time zone is an optional component. Maximum length of the time stamp is 26.

Examples:

```
|19760704010159-0600|
```

Indicates 1:01:59 on July 4, 1976 in the Eastern Standard Time zone.

```
|19760704010159-0500|
```

Indicates 1:01:59 on July 4, 1976 in the Eastern Daylight Saving Time zone.

```
|198807050000|
```

Indicates midnight of the night extending from July 4 to July 5, 1988 in the local time zone of the sender.

```
|19880705|
```

Same as prior example, but precision extends only to the day. Could be used for a birth date, if the time of birth is unknown.

The HL7 Standard strongly recommends that all systems routinely send the time zone offset but does not require it. All HL7 systems are required to accept the time zone offset, but its implementation is application specific. For many applications the time of interest is the local time of the sender. For example, an application in the Eastern Standard Time zone receiving notification of an admission that takes place at 11:00 PM in San Francisco on December 11 would prefer to treat the admission as having occurred on December 11 rather than advancing the date to December 12.

XAD - Address

This data type indicates a postal address. It uses the following format:

<street address (ST)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip or postal code(ST)> ^ <country (ID)> ^ < address type (ID)> ^ <other geographic designation (ST)>^ <county/parish code (IS)> ^ <census tract (IS)> ^<address representation code (ID)>

Example:

```
|1234 Easy St.^Ste. 123^San Francisco^CA^95123^USA^B^^SF^^|
```

Street address (ST): The street or mailing address of a person or institution.

Other designation (ST): Second line of address. In general, it qualifies address. Examples: Suite 555 or Fourth Floor.

City (ST):

State or province (ST): State or province should be represented by the official postal service codes for that country.

Zip or postal code (ST): Zip or postal codes should be represented by the official codes for that country. In the US, the zip code takes the form 99999[-9999], while the Canadian postal code takes the form A9A-9A9.

Country (ID): Defines the country of the address. See Table 0212

Address type (ID): Address type is optional.

Other geographic designation (ST): Other geographic designation includes country, bioregion, SMSA, etc.

County code (IS): A code that represents the county in which the specified address resides. Refer to user-defined table 0289 - County. When this component is used to represent the county, component 8 'other geographic designation' should not duplicate it (i.e., the use of 'other geographic designation' to represent the county is allowed only for the purpose of backward compatibility, and should be discouraged in this and future versions of HL7).

Census tract (IS): An optional code that represents the census track in which the specified address resides. IRIS does not store this value.

XCN - Extended Composite ID Number and Name for Persons

IRIS uses this data type only to identify Provider Organizations that administer immunizations. See the field notes for segment RXA.

XPN - Extended Person Name

This data type indicates the long form of a person's given name and titles. It follows this format:

<family name (ST)> & <last name prefix (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <name type code (ID) > ^ <name representation code (ID)>

Example:

```
|Smith&St^John^J^III^DR^PHD^L|
```

Family name (ST):

Last Name Prefix (ST): Used to specify a name prefix (e.g., "De La").

Given name (ST):

Middle initial or name (ST): IRIS encourages the use of middle initials, even if the full name is not known.

Suffix (ST): Used to specify a name suffix (e.g., Jr. or III).

Prefix (ST): Used to specify a name prefix (e.g., Dr.).

Degree (ST): Used to specify an educational degree (e.g., MD).

Name type code (ID): A code that represents the type of name. Refer to the following table from the HL7 Standard.

HL7 Table 0200 – Name Type	
Value	Description
A	Alias Name
L	Legal Name
D	Display Name
M	Maiden Name
C	Adopted Name

Note: The legal name is the same as the current married name.

Name representation code (ID): This component can be used when names are represented in ideographic or non-alphabetic systems. IRIS ignores this component.

XTN - Extended Telecommunication Number

This data type is used to express telecommunications information. It uses the following format:

[NNN][(999)]999-9999[X99999][B99999][C any text]^<telecommunication use code (ID)>^<telecommunication equipment type (ID)>^<email address (ST)>^<country code (NM)>^<area/city code (NM)>^<phone number (NM)>^<extension (NM)>^<any text (ST)> [(999)] 999-9999 [X99999][C any text]

Example:

```
|(555)123-4567^PRN^PH|
```

Telecommunication use code (ID): A code that represents a specific use of a telecommunication number. In IRIS this value is always 'PRN' (indicating Primary Residence Number) from the HL7 table 0201 – Telecommunication Use Code. Other values received will be treated as PRN.

Telecommunication equipment type (ID): A code that represents the type of telecommunication equipment. In IRIS this value is always 'PH' (indicating Telephone) from the HL7 table 0202 – Telecommunication Equipment Type. Other values received will be treated as PH.

Email address (ST): IRIS reads this value when entered under PID-13 only. It will not read NK1 email addresses.

Country code (NM):

Area/city code (NM): IRIS will populate this field in output messages using the data in the first XTN component.

Phone number (NM): IRIS will populate this field in output messages using the data in the first XTN component.

Extension (NM): IRIS will populate this field in output messages using the data in the first XTN component.

Any Text (ST): IRIS disregards this component

Appendix B - HL7 Tables

The following tables give valid values for fields in the segments defined above, in the cases where the field definitions reference an HL7 table number. The tables are considered to be part of the HL7 standard, but those tables designated as type User have values determined by IRIS.

Type	Table	Name	Value	Description
HL7	**0001**	**Sex**	**(use in PID-8)**	
	0001		F	Female
	0001		M	Male
	0001		U	Unknown
HL7	**0003**	**Event Type**	**(use in MSH-9, second component)**	
	0003		A24	ADT/ACK - Link patient information
	0003		A28	ADT/ACK - Add patient information
	0003		A31	ADT/ACK - Update patient information
	0003		A37	ADT/ACK - Unlink patient information
	0003		V01	VXQ - Query for vaccination record
	0003		V02	VXX - Response to vaccination query returning multiple PID matches
HL7	**0005**	**Race**	**(use in PID-10)**	
	0005		1002-5	American Indian or Alaska Native
	0005		2028-9	Asian
	0005		2076-8	Native Hawaiian or Other Pacific Islander
	0005		2054-5	Black or African-American
	0005		2106-3	White
	0005		2131-1	Other Race
HL7	**0008**	**Acknowledgment Code**	**(use in MSA-1)**	
	0008		AA	Application Accept
	0008		AE	Application Error
	0008		AR	Application Reject
HL7	**0048**	**What Subject Filter**	**(use in QRD-9)**	
	0048		VXI	Vaccine Information
User	**0063**	**Relationship**	**(use in NK1-3)**	
	0063		ASC	Associate
	0063		BRO	Brother
	0063		CGV	Care giver
	0063		CHD	Child
	0063		DEP	Handicapped dependent
	0063		DOM	Life partner
	0063		EMC	Emergency contact
	0063		EME	Employee
	0063		EMR	Employer
	0063		EXF	Extended family
	0063		FCH	Foster Child
	0063		FND	Friend
	0063		FTH	Father
	0063		GCH	Grandchild
	0063		GRD	Guardian
	0063		GRP	Grandparent
	0063		MGR	Manager
	0063		MTH	Mother
	0063		NCH	Natural child

Type	Table	Name	Value	Description
	0063		NON	None
	0063		OAD	Other adult
	0063		OTH	Other
	0063		OWN	Owner
	0063		PAR	Parent
	0063		SCH	Stepchild
	0063		SEL	Self
	0063		SIB	Sibling
	0063		SIS	Sister
	0063		SPO	Spouse
	0063		TRA	Trainer
	0063		UNK	Unknown
	0063		WRD	Ward of court
HL7	**0076**	**Message Type**	**(use in MSH-9, first component)**	
	0076		ACK	General acknowledgment message
	0076		ADR	ADT response
	0076		ADT	ADT message
	0076		QCK	Query general acknowledgment
	0076		VXQ	Query for vaccination record
	0076		VXX	Vaccination query response with multiple PID matches
	0076		VXR	Vaccination query record response
	0076		VXU	Unsolicited vaccination record update
	0076		ORU	Unsolicited observation results
HL7	**0085**	**Observation result status codes**	**(use in OBX-11)**	
	0085		F	Final results
	0085		O	Order detail description only
HL7	**0091**	**Query Priority**	**(use in QRD-3)**	
	0091		I	Immediate
HL7	**0103**	**Processing ID**	**(use in MSA-11, first component)**	
	0103		P	Production
HL7	**0104**	**Version ID**	**(use in MSH-12)**	
	0104		2.3.1	CDC IG Version 2.1, HL7 2.3.1, 2002 and CDC IG Version 2.2, HL7 2.3.1, 2006
	0104		2.4	CDC IG Version 2.1, HL7 2.3.1, 2002 and CDC IG Version 2.2, HL7 2.3.1, 2006
HL7	**0106**	**Query/Response format code**	**(use in QRD-2)**	
	0106		R	Response is in record-oriented format
HL7	**0126**	**Quantity limited request**	**(use in QRD-7)**	
	0126		RD	Records
HL7	**0136**	**Yes/No Indicator**	**(use in PID-24)**	
	0136		Y	Yes
	0136		N	No
HL7	**0155**	**Accept/Application Acknowledgment Conditions**	**(use in MSH-15)**	

Type	Table	Name	Value	Description
	0155		AL	Always
	0155		NE	Never
	0155		ER	Error/reject conditions only
	0155		SU	Successful completion only
HL7	**0162**	**Route of Administration**	**(use in RXR-1)**	
	0162		ID	Intradermal
	0162		IM	Intramuscular
	0162		IN	Intranasal
	0162		IV	Intravenous
	0162		PO	Oral
	0162		SC	Subcutaneous
	0162		TD	Transdermal
	0162		MP	Percutaneous (multiple puncture - Small Pox)
HL7	**0163**	**Administrative Site**	**(use in RXR-2)**	
	0163		BN	Bilateral Nares
	0163		LA	Left Arm
	0163		LD	Left Deltoid
	0163		LG	Left Gluteus Medius
	0163		LLFA	Left Lower Forearm
	0163		LN	Left Nares
	0163		LT	Left Thigh
	0163		LVL	Left Vastus Lateralis
	0163		MO	Mouth
	0163		RA	Right Arm
	0163		RD	Right Deltoid
	0163		RG	Right Gluteus Medius
	0163		RLFA	Right Lower Forearm
	0163		RN	Right Nares
	0163		RT	Right Thigh
	0163		RVL	Right Vastus Lateralis
HL7	**0189**	**Ethnic Group**	**(use in PID-22)**	
	0189		2135-2	Hispanic
	0189		2186-5	Non-Hispanic
	0189			Unknown
User	**0190**	**Address type**	**(use in PID-11; NK1-4)**	
	0190		H	Home
	0190		O	Office
User	**0200**	**Name type**	**(use in PID-5, 6; NK1-2)**	
	0200		L	Legal name
	0200		M	Maiden name
User	**0201**	**Telecommunication use code**	**(use in PID-13; NK1-5)**	
	0201		PRN	Primary residence number
User	**0202**	**Telecommunication equipment type**	**(use in PID-13; NK1-5)**	
	0202		PH	Telephone
HL7	**0203**	**Identifier type**	**(use in PID-3)**	
	0203		BR	Birth Registry Number
	0203		MA	Medicaid Number
	0203		MC	Medicare Number
	0203		MR	Medical Record Number

Type	Table	Name	Value	Description
	0203		PI	Patient Internal Identifier
	0203		PN	Person Number
	0203		PRN	Provider Number
	0203		PT	Patient External Identifier
	0203		RRI	Regional Registry ID
	0203		SR	State Registry Identifier
	0203		SS	Social Security Number
User	**0207**	**Processing mode**	**(use in MSH-11, second component)**	
	0207		A	Archive
	0207		R	Restore from archive
	0207		I	Initial load
	0207		T	Current processing, transmitted at intervals (scheduled or on demand)
User	**0208**	**Query response status**	**(find in QAK-2)**	
	0208		NF	No data found, no errors
User	**0212**	**Nationality**	**(use in PID-11; NK1-4)**	
	0212		CA	Canada
	0212		US	United States of America
User	**0215**	**Publicity Code**	**(use in PD1-11)**	
	0215		01	No reminder/recall
	0215		02	Yes reminder/recall – any method
HL7	**0227**	**Manufacturers of vaccines(code = MVX)**	**(use in RXA-17)**	
	0227		AB	Abbott Laboratories
	0227		ACA	Acambis, Inc. [Inactive see sanofi pasteur]
	0227		AD	Adams Laboratories, Inc.
	0227		AKR	Akorn, Inc.
	0227		ALP	Alpha Therapeutic Corporation
	0227		AR	Armour [Inactive- use AVB]
	0227		AVB	Aventis Behring L.L.C. [Inactive – use ZLB]
	0227		AVI	Aviron
	0227		BRR	Barr Laboratories
	0227		BA	Baxter Healthcare Corporation [Inactive- use BAH]
	0227		BAH	Baxter Healthcare Corporation
	0227		BAY	Bayer
	0227		BP	Berna Products
	0227		BPC	Berna Products Corporation
	0227		BTP	Biotest Pharmaceuticals Corporation
	0227		MIP	Bioport Corporation (formerly Michigan BiologicProducts Institute)
	0227		CSL	CSL Biotherapies, Inc.
	0227		CNJ	Cangene Corporation
	0227		CMP	Celltech Medeva Pharmaceuticals [Inactive-use NOV]
	0227		CEN	Centeon [Inactive- use AVB]
	0227		CHI	Chiron Corporation [Inactive – use NOV] (includes PowderJect Pharmaceuticals, Celltech Medeva Vaccines and Evans Medical Limited)

Type	Table	Name	Value	Description
	0227		CON	Connaught [Inactive- use PMC]
	0227		DVC	DynPort Vaccine Company, LLC
	0227		EVN	Evans Medical Limited [Inactive- use NOV]
	0227		GEO	GeoVax Labs, Inc.
	0227		SKB	GlaxoSmithKline (formerly SmithKline Beecham; includes SmithKline Beecham and Glaxo Wellcome)
	0227		GRE	Greer Laboratories Inc.
	0227		IAG	Immuno International AG [Inactive- use BAH]
	0227		IUS	Immuno-U.S., Inc.
	0227		INT	Intercell Biomedical
	0227		KGC	Korea Green Cross Corporation
	0227		LED	Lederle [Inactive-use WAL]
	0227		MBL	Massachusetts Biologic Laboratories (formerly Massachusetts Public Heath Biologic Laboratories)
	0227		MA	Massachusetts Public Health Biologic Laboratories[Inactive-use MBL]
	0227		MED	MedImmune, Inc.
	0227		MSD	Merck & Co., Inc.
	0227		IM	Merieux [Inactive-use PMC]
	0227		MIL	Miles [Inactive-use BAY]
	0227		NAB	NABI (formerly North American Biologicals, Inc.)
	0027		NYB	New York Blood Center
	0227		NAV	North American Vaccine, Inc. [Inactive-use BAH]
	0227		NOV	Novartis Pharmaceutical Corp
	0227		NVX	Novavax, Inc.
	0227		OTC	Organon Teknika Corporation
	0227		ORT	Ortho-clinical Diagnostics (formerly Ortho Diagnostic Systems, Inc.)
	0227		PD	Parkedale Pharmaceuticals (formerly Parke-Davis)
	0227		PFR	Pfizer-Wyeth
	0227		PWJ	PowerJect Pharmaceuticals [Inactive- use NOV]
	0227		PRX	Praxis Biologics [Inactive- use WAL]
	0227		PMC	Sanofi Pasteur Inc.
	0227		JPN	Osaka University
	0227		SCL	Sclavo, Inc.
	0227		SOL	Solvay Pharmaceuticals
	0227		SI	Swiss Serum and Vaccine Inst. [Inactive-use BPC]
	0227		TAL	Talecris Biotherapeutics
	0227		USA	United States Army Medical Research and Material Command
	0227		VXG	VaxGen
	0227		WA	Wyeth-Ayerst [Inactive- use WAL]
	0227		WAL	Wyeth-Ayerst [Inactive]
	0227		ZLB	ZLB Behring
	0227		OTH	Other manufacturer
	0227		UNK	Unknown manufacturer
User	**0289**	**County (Iowa only)**	**(use in PID-11;**	

Type	Table	Name	Value	Description
			NK1-4)	
	0289		IA001	Adair
	0289		IA003	Adams
	0289		IA005	Allamakee
	0289		IA007	Appanoose
	0289		IA009	Audubon
	0289		IA011	Benton
	0289		IA013	Black Hawk
	0289		IA015	Boone
	0289		IA017	Bremer
	0289		IA019	Buchanan
	0289		IA021	Buena Vista
	0289		IA023	Butler
	0289		IA025	Calhoun
	0289		IA027	Carroll
	0289		IA029	Cass
	0289		IA031	Cedar
	0289		IA033	Cerro Gordo
	0289		IA035	Cherokee
	0289		IA037	Chickasaw
	0289		IA039	Clarke
	0289		IA041	Clay
	0289		IA043	Clayton
	0289		IA045	Clinton
	0289		IA047	Crawford
	0289		IA049	Dallas
	0289		IA051	Davis
	0289		IA053	Decatur
	0289		IA055	Delaware
	0289		IA057	Des Moines
	0289		IA059	Dickinson
	0289		IA061	Dubuque
	0289		IA063	Emmet
	0289		IA065	Fayette
	0289		IA067	Floyd
	0289		IA069	Franklin
	0289		IA071	Fremont
	0289		IA073	Greene
	0289		IA075	Grundy
	0289		IA077	Guthrie
	0289		IA079	Hamilton
	0289		IA081	Hancock
	0289		IA083	Hardin
	0289		IA085	Harrison
	0289		IA087	Henry
	0289		IA089	Howard
	0289		IA091	Humboldt
	0289		IA093	Ida
	0289		IA095	Iowa
	0289		IA097	Jackson
	0289		IA099	Jasper
	0289		IA101	Jefferson
	0289		IA103	Johnson
	0289		IA105	Jones

Type	Table	Name	Value	Description
	0289		IA107	Keokuk
	0289		IA109	Kossuth
	0289		IA111	Lee
	0289		IA113	Linn
	0289		IA115	Louisa
	0289		IA117	Lucas
	0289		IA119	Lyon
	0289		IA121	Madison
	0289		IA123	Mahaska
	0289		IA125	Marion
	0289		IA127	Marshall
	0289		IA129	Mills
	0289		IA131	Mitchell
	0289		IA133	Monona
	0289		IA135	Monroe
	0289		IA137	Montgomery
	0289		IA139	Muscatine
	0289		IA141	O'Brien
	0289		IA143	Osceola
	0289		IA145	Page
	0289		IA147	Palo Alto
	0289		IA149	Plymouth
	0289		IA151	Pocahontas
	0289		IA153	Polk
	0289		IA155	Pottawattamie
	0289		IA157	Poweshiek
	0289		IA159	Ringgold
	0289		IA161	Sac
	0289		IA163	Scott
	0289		IA165	Shelby
	0289		IA167	Sioux
	0289		IA169	Story
	0289		IA171	Tama
	0289		IA173	Taylor
	0289		IA175	Union
	0289		IA177	Van Buren
	0289		IA179	Wapello
	0289		IA181	Warren
	0289		IA183	Washington
	0289		IA185	Wayne
	0289		IA187	Webster
	0289		IA189	Winnebago
	0289		IA191	Winneshiek
	0289		IA193	Woodbury
	0289		IA195	Worth
	0289		IA197	Wright
HL7	**0322**	**Completion Status**	**(use in RXA-20)**	
	0322		CP	Complete
	0322		RE	Refused
	0322		NA	Not Administered
	0322		PA	Partially Administered ("sub potent?" dose)
HL7	**0323**	**Action code**	**(use in RXA-21)**	

Type	Table	Name	Value	Description
	0323		A	Add
	0323		D	Delete
	0323		U	Update
HL7	**0357**	**Message error status code**	**(find in ERR-1)**	
	0357		0	Message accepted
	0357		100	Segment sequence error
	0357		101	Required field missing
	0357		102	Invalid data value
	0357		103	Table value not found
	0357		104	Required Segment missing
	0357		105	Invalid data value
	0357		200	Unsupported message type
	0357		201	Unsupported event code
	0357		202	Unsupported processing ID
	0357		203	Unsupported version ID
	0357		204	Unknown key identifier
	0357		205	Duplicate key identifier
	0357		206	Application record locked
	0357		207	Application internal error
	0357		500	Record not released
User	**0441**	**Immunization Registry Status**	**(use in PD1-16)**	
	0441		A	Active
	0441		I	Inactive-Other
	0441		M	Inactive-MOGE
	0441		P	Inactive-Permanently (deceased)
	0441		L	Inactive-Lost to Follow Up
	0441		O	Inactive-One Time Only
	0441		S	Inactive-MOOSA
	0441		U	Inactive-Unknown
NIP	**NIP001**	**Immunization Inflammation Source**	**(use in RXA-9)**	
	NIP001		00	New Immunization Administered (by Sending Organization)
	NIP001		01	Source Unspecified
	NIP001		02	Other Provider
	NIP001		03	Parent Written Record
	NIP001		04	Parent Recall
	NIP001		05	Other Registry
	NIP001		06	Birth Certificate
	NIP001		07	School Record
	NIP001		OU	Outside USA
NIP	**NIP002**	**Substance Refusal Reason**		
	NIP002		00	Parental Refusal
	NIP002		01	Religious Exemption
LN	**NIP003**	**Observation Identifiers**	**(use in OBX-3)**	
	NIP003		30945-0	Vaccination contraindication/precaution
	NIP003		31044-1	Reaction
	NIP003		30949-2	Vaccination adverse event outcome
	NIP003		30963-3	Vaccines purchased with
	NIP003		38890-0	Component Vaccine Type. This term is used to distinguish separate vaccine components of a

Type	Table	Name	Value	Description
				multiple antigen vaccine. Included in LOINC 1/2005.
	NIP003		30973-2	38890-0&30973-2 – Dose Number in Series
	NIP003		30979-9	Vaccines due next
	NIP003		30980-7	30979-9&30980-7 – Date vaccine due
	NIP003		30973-2	30979-9&30973-2 – Vaccine due next dose number
	NIP003		30981-5	30979-9&30981-5 – Earliest date to give
	NIP003		30982-3	30979-9&30982-3 – Reason applied by forecast logic to project this vaccine
NIP	**NIP004**	**Contraindications, Precautions**	**(use in OBX-5)**	
	NIP004		03	Allergy to baker's yeast (anaphylactic)
	NIP004		04	Allergy to egg ingestion (anaphylactic)
	NIP004		05	Allergy to gelatin (anaphylactic)
	NIP004		LTX_A	Allergy to latex (anaphylactic)
	NIP004		06	Allergy to neomycin (anaphylactic)
	NIP004		PLYB_A	Allergy to POLYMYXIN B
	NIP004		07	Allergy to streptomycin (anaphylactic)
	NIP004		08	Allergy to thimerosal (anaphylactic)
	NIP004		09	Allergy to previous dose of this vaccine or to any of its unlisted vaccine components (anaphylactic)
	NIP004		10	Anaphylactic (life-threatening) reaction to previous dose of this vaccine
	NIP004		ARTHUS	Arthus type reaction to previous dose of tetanus containing vaccine.
	NIP004		11	Collapse or shock like state within 48 hours of previous dose of DTP/DTaP
	NIP004		12	Convulsions (fits, seizures) within 3 days of previous dose of DTP/DTaP
	NIP004		13	Persistent, inconsolable crying lasting 3 hours within 48 hours of previous dose of DTP/DTaP
	NIP004		14	Current diarrhea, moderate to severe
	NIP004		15	Encephalopathy within 7 days of previous dose of DTP
	NIP004		16	Current fever with moderate-to-severe illness
	NIP004		17	Fever of 40.5 C (105 F) within 48 hours of previous dose of DTP/DTaP
	NIP004		18	Gullain-Barre syndrome (GBS) within 6 weeks of previous dose of DTP/DTaP
	NIP004		18A	History of Gullain-Barre syndrome (GBS)
	NIP004		33A	History of Varicella
	NIP004		21	Current acute illness, moderate to severe (with or without fever) (e.g. diarrhea, otitis media, vomiting)
	NIP004		22	Chronic illness (e.g. chronic gastrointestinal disease)
	NIP004		23	Immune globulin (IG) administration, recent or simultaneous
	NIP004		24	Immunity: diphtheria
	NIP004		HEPA_I	Immunity: hepatitis A
	NIP004		25	Immunity: Haemophilus influenzae type B (Hib)
	NIP004		26	Immunity: hepatitis B

Type	Table	Name	Value	Description
	NIP004		27	Immunity: measles
	NIP004		28	Immunity: mumps
	NIP004		29	Immunity: pertussis
	NIP004		30	Immunity: poliovirus
	NIP004		31	Immunity: rubella
	NIP004		32	Immunity: tetanus
	NIP004		33	Immunity: varicella (chicken pox)
	NIP004		OTH_I	Immunity: other lab confirmed
	NIP004		36	Immunodeficiency (hematologic and solid tumors, congenital immunodeficiency, long-term immunosuppressive therapy, including steroids) (in recipient)
	NIP004		36A	Temporary immunodeficiency caused by immunosuppressive therapy, including steroids, radiation treatment or chemotherapy.
	NIP004		37	Neurologic disorders, underlying (including seizure disorders, cerebral palsy, and developmental delay)
	NIP004		38	Otitis media (ear infection) moderate to severe (with or without fever)
	NIP004		39	Pregnancy (in recipient)
	NIP004		40	Thrombocytopenia
	NIP004		41	Thrombocytopenic purpura (history)
	NIP004		RABEXP	Patient has been exposed to Rabies
	NIP004		HIRISK	High Risk Condition(s)
	NIP004		10_11	PRIOR doses OF HEPA caused anaphylactic reaction
	NIP004		10_12	PRIOR doses OF HEPB caused anaphylactic reaction
	NIP004		10_129	PRIOR doses OF ZOSTER caused anaphylactic reaction
	NIP004		10_13	PRIOR doses OF HIB caused anaphylactic reaction
	NIP004		10_130	PRIOR doses OF HUMAN PAPILLOMA VIRUS caused anaphylactic reaction
	NIP004		10_16	PRIOR doses OF MENINGO caused anaphylactic reaction
	NIP004		10_17	PRIOR doses OF MMR caused anaphylactic reaction
	NIP004		10_19	PRIOR doses OF PNEUMOCONJUGATE caused anaphylactic reaction
	NIP004		10_20	PRIOR doses OF POLIO caused anaphylactic reaction
	NIP004		10_23	PRIOR doses OF ROTAVIRUS caused anaphylactic reaction
	NIP004		10_24	PRIOR doses OF TYPHOID caused anaphylactic reaction
	NIP004		10_26	PRIOR doses OF VARICELLA caused anaphylactic reaction
	NIP004		10_27	PRIOR doses OF YELLOW FEVER caused anaphylactic reaction
	NIP004		10_31	PRIOR doses OF TETANUS caused anaphylactic reaction
	NIP004		10_34	PRIOR doses OF PNEUMOPOLY 23 caused

Type	Table	Name	Value	Description
				anaphylactic reaction
	NIP004		10_48	PRIOR doses OF IG-RSV IGIM caused anaphylactic reaction
	NIP004		10_6	PRIOR doses OF TD/TDAP caused anaphylactic reaction
	NIP004		10_7	PRIOR doses OF DTAP caused anaphylactic reaction
	NIP004		10_8	PRIOR doses OF ENCEPHALITIS caused anaphylactic reaction
	NIP004		10_9	PRIOR doses OF INFLUENZA caused anaphylactic reaction
NIP	**NIP005**	**Event Consequence**	**(use in OBX-5)**	
	NIP005		D	Patient Died
	NIP005		L	Life threatening illness
	NIP005		E	Required emergency room/doctor visit
	NIP005		H	Required hospitalization
	NIP005		P	Resulted in prolongation of hospitalization
	NIP005		J	Resulted in permanent disability
NIP	**NIP008**	**Funding Type**	**(use in OBX-5)**	
	NIP008		PBF	Public Funding
	NIP008		PVF	Private Funding
IRIS	**IA001**	**Reaction Codes**	**(use in OBX-5)**	
	IA001		10	Anaphylactic reaction
	IA001		11	Hypotonic-hyporesponsive collapse within 48 hours of immunization
	IA001		12	Seizure occurring within 3 days of immunization
	IA001		13	Persistent crying lasting >= 3 hours within 48 hours of immunization
	IA001		17	Temperature >= 105 (40.5 C) within 48 hours of immunization
	IA001		PERTCONT	Pertussis allergic reaction
	IA001		TETCONT	Tetanus allergic reaction
IRIS	**IA002**	**Vaccine Eligibility Code**	**(use in OBX-5)**	
	IA002		V01	N – Not VFC Eligible
	IA002		V02	M – Medicaid Enrolled
	IA002		V03	NI- No Insurance
	IA002		V04	AI-American Indian/Alaska Native
	IA002		V05	UI- Underinsured
IRIS	**IA003**	**State Code**	**(use in PID-11; NK1-4)**	
	IA003		AL	ALABAMA
	IA003		AK	ALASKA
	IA003		AZ	ARIZONA
	IA003		AR	ARKANSAS
	IA003		CA	CALIFORNIA
	IA003		CO	COLORADO
	IA003		CT	CONNECTICUT
	IA003		DE	DELAWARE
	IA003		DC	DISTRICT OF COLUMBIA
	IA003		FL	FLORIDA
	IA003		GA	GEORGIA
	IA003		OK	OKLAHOMA
	IA003		HI	HAWAII

Type	Table	Name	Value	Description
	IA003		ID	IDAHO
	IA003		IL	ILLINOIS
	IA003		IN	INDIANA
	IA003		IA	IOWA
	IA003		KS	KANSAS
	IA003		KY	KENTUCKY
	IA003		LA	LOUISIANA
	IA003		ME	MAINE
	IA003		MD	MARYLAND
	IA003		MA	MASSACHUSETTS
	IA003		MI	MICHIGAN
	IA003		MN	MINNESOTA
	IA003		MS	MISSISSIPPI
	IA003		MO	MISSOURI
	IA003		MT	MONTANA
	IA003		NE	NEBRASKA
	IA003		NV	NEVADA
	IA003		NH	NEW HAMPSHIRE
	IA003		NJ	NEW JERSEY
	IA003		NM	NEW MEXICO
	IA003		NY	NEW YORK
	IA003		NC	NORTH CAROLINA
	IA003		ND	NORTH DAKOTA
	IA003		OH	OHIO
	IA003		OR	OREGON
	IA003		PA	PENNSYLVANIA
	IA003		RI	RHODE ISLAND
	IA003		SC	SOUTH CAROLINA
	IA003		SD	SOUTH DAKOTA
	IA003		TN	TENNESSEE
	IA003		TX	TEXAS
	IA003		UT	UTAH
	IA003		VA	VIRGINIA
	IA003		WA	WASHINGTON
	IA003		WV	WEST VIRGINIA
	IA003		WI	WISCONSIN
	IA003		WY	WYOMING
	IA003		AS	AMERICAN SAMOA
	IA003		FM	FEDERATED STATES OF MICRONESIA
	IA003		GU	GUAM
	IA003		MH	MARSHALL ISLANDS
	IA003		MP	NORTHERN MARIANA ISLANDS
	IA003		PW	PALAU
	IA003		PR	PUERTO RICO
	IA003		UM	US MINOR OUTLYING ISLANDS
	IA003		VI	US VIRGIN ISLANDS
	IA003		VT	VERMONT
HL7	**CVX (0292)**	**Vaccines Administered**	**(use in RXA-5)**	**See IRIS Vaccine Codes PDF or Spreadsheet**
HL7	**CPT**	**Current Procedural Code**	**(use in RXA-5)**	**See IRIS Vaccine Codes PDF or Spreadsheet**
IRIS	**WVGC**	**Vaccine Group Code**	**(use in RXA-5)**	**See IRIS Vaccine Codes PDF or**

Type	Table	Name	Value	Description
				Spreadsheet
IRIS	WVTN	Vaccine Trade Name	(use in RXA-5)	See IRIS Vaccine Codes PDF or Spreadsheet
IRIS	NDC	National Drug Code	(use in RXA-5)	See IRIS Vaccine Codes PDF or Spreadsheet

Appendix C – Vaccine Codes

Please see the IRIS Vaccine Codes PDF or Spreadsheet for a listing of vaccine codes including: CVX Code, CPT Code, NDC Code, Trade Name, and Vaccine Group.

Change History

Published / Revised Date	Version #	Author	Section / Nature of Change
06/25/2010	1.0	HP	Initial approved version.
07/29/2010	1.1	HP	Correction. OBX Example 3 LOINC code is 30949-2. OBX Example 4 LOINC code is 30963-3.
10/01/2010	1.2	HP	Pg 5 – carriage return/line feed Pg 24 – Update bi-directional image to display VXU sent from Registry to Provider Application Pg 36 – Two Relationships removed =OWN‘ and =TRN‘
3/25/2011	1.3	HP	Merged “General” and “Real-time” specifications into this one document. Also added Web Services related information.
5/3/2011	1.4	HP	Applied changes to HL7-defined Table 0227 – Manufacturers of Vaccines. Changes per Change Request (CR) CR10010.
5/9/2011	1.5	HP	Applied changes per OHA review and added "Master Field List"
7/1/2011	1.6	HP OHA	Document has gone through additional OHA reviews and changes as well as an HP internal review.
11/4/2011	1.7	OHA	Clarified references to HL7 versions 2.3.1 and 2.4
4/23/2012	1.8	HP	Added funding type OBX segment, updated Table IA002.
4/30/2012	1.9	HP	Formatting overhaul. Rebuilt links, table of contents, and unified theme settings. Removed references to unsupported QRD and QRF fields and other legacy HL7 documentation. Added to and clarified sections on data type and exchanges.
05/07/2012	1.10	HP	Deleted: Note 2: Sending ADT and VXU messages for the same patient is redundant, since the VXU message is capable of reporting all information that is also found in the ADT. Reason: ADT and VXU messages are different. ADT messages are reserved for only updating patient demographics and VXU messages can also update patient demographics but require a RXA segment as well. IRIS can accept both types of messages but prefers VXU. Changes were made to the XTN data type section
05/14/2012	2.0	HP	Approved Version