
Vermont Department of Health

Vermont Implementation Guide for HL7 Immunization Messaging

Version 4.0

Revision History

Date	Version	Description	Author
January 5, 2011	1.0	Modified from Template supplied by Rob Savage of CDC	Karen Clark
February 3, 2011	1.1	Aligned VXU specification with HL7 2.5.1	Lauri Scharf
February 23, 2011	1.2	Clarifications to PV1, PD1, RXA; update to which fields are required; update to sample message	Lauri Scharf
May 17, 2011	1.3	Removed EVN segment; updated sample VXU	Jennifer Moran
May 26, 2011	1.4	Updated to use 3 letter country code; updated sample VXU	Jennifer Moran
June 20, 2011	1.5	Updated value for RXA-9 from NIP0001 to NIP001; updated sample VXU	Jennifer Moran
March 5, 2012	1.6	Minor vendor-related updates, clarified expectation for NK1	Jennifer Moran
May 15, 2012	1.7	Removed ORC-12 requirement; added V02 for PV1-20.1; updated sample VXU	Jennifer Moran
August 15, 2012	1.8	Removed PV1 segment; Added VFC eligibility and VIS Material OBX segments; Updated sample VXU	Matt Sontum
October 2, 2012	1.9	Incorporating feedback from Rob Savage. All fields marked as RE in the federal implementation guide are now	Matt Sontum

		marked as RE in the local implementation guide. V07 is now accepted as a valid VFC eligibility code. PID.19 now correctly listed as deprecated. PD1.3 modified to follow standard XON data type format	
May 1, 2013	2.0	Clarification on all date/time fields, and city/state/zip validation. Corrections to PID:13.7, NK1:3, RXR:1.1, ORC:3.1, and sample VXU.	Karen Clark
May 4, 2014	3.0	Corrected typos in sample message and RXR segment, updated values in PID 10	Karen Clark
July 15, 2014	4.0	Updated values for RXA-21, PID-16, MSH-5, MSH-6	Sandra LeBlanc

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1. Introduction

The Vermont Department of Health (VDH), in partnership with Vermont Information Technology Leaders (VITL), present this implementation guide as a supplement to the CDC HL7 Version 2.5.1 Implementation Guide for Immunization Messaging.

This guide contains technical Immunization Message formatting instructions and requirements specific to the State of Vermont. All information presented here represents either a reiteration or a narrowing of the specifications outlined in the CDC HL7 Version 2.5.1 Implementation Guide for Immunization Messaging.

In order for different health information systems to exchange data, the structure and content of the data to be exchanged must be standardized. There are three controlling documents that define how the Vermont Immunization HL7 data exchange interface works. They are arranged in a hierarchy of documents, each refining and constraining the HL7 Standard.

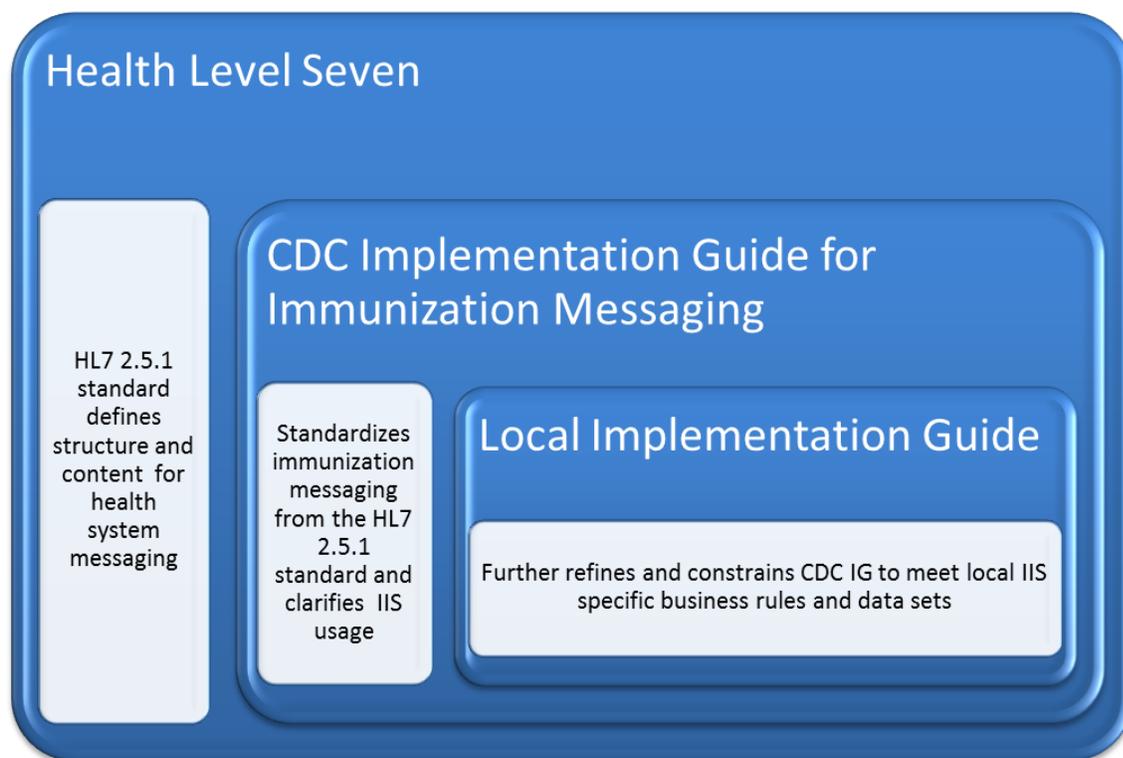


Figure 1: HL7 Controlling Document Hierarchy

The first document is the HL7 2.5.1 standard developed by Health Level Seven, a not-for-profit ANSI-accredited standards developing organization. This standard defines the structure and content of immunization messages, but leaves many specific implementation details undecided.

Beneficial information on HL7 and a copy of the HL7 message standard can be obtained from the Health Level Seven website at <http://www.hl7.org>.

The second document is the CDC's **HL7 2.5.1 Implementation Guide for Immunization Messaging, Release 1.4** (CDC IG). This guide gives specific instructions regarding how to report to immunization information systems, but still leaves some implementation decisions to each state Immunization Information Systems (IIS). This guide and other technical information can be obtained from the CDC website at <http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html>.

The third document is this document. It finalizes all implementation decisions and defines exactly what the Vermont Health Information Exchange on behalf of the Vermont Immunization Registry will and will not accept.

Intended Audience

This guide is intended for technical groups from IIS and Electronic Health Record Systems (EHR-S) that must implement these guidelines. The reader of this Guide should have a solid HL7 foundation and be very familiar with the contents of the CDC IG. Chapters 2 and 3 of the CDC IG provide HL7 foundational concepts and set the stage for this Guide. The goal of this implementation guide is to provide an unambiguous specification for creating and interpreting messages.

Scope

This Guide is intended to facilitate the exchange of immunization records between external Health Systems and the Vermont Immunization Registry. This includes:

- sending immunization histories for individuals
- sending and receiving demographic information about the individuals
- acknowledging receipt of immunization histories and demographic information about individuals
- reporting errors in the messaging process

Items that will be addressed in the next phase, and are out of scope at this time, include:

- requesting immunization histories for individuals
- responding to requests for immunization histories by returning immunization histories
- acknowledging receipt of requests for immunization histories

To support Vermont Immunization Messaging, both an ADT (patient demographics) and a VXU (immunizations) interface are required by a submitting practice.

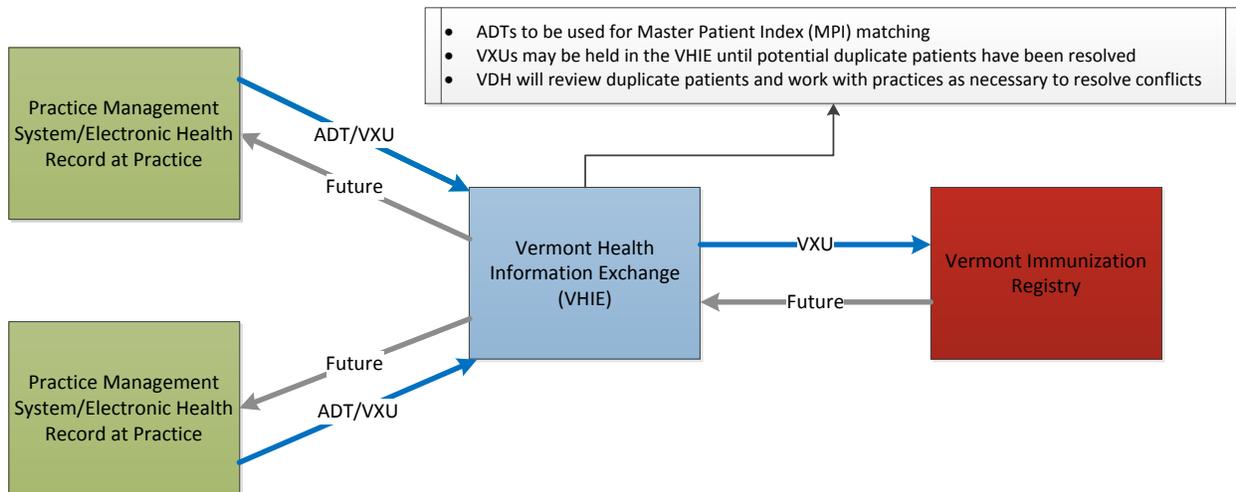


Figure 2: Interface/Health Information Exchange Infrastructure

2. Actors, Goals, and Messaging Transactions

Chapter 2 of the CDC IG defines actors (entities) that may be involved in sending or receiving immunization-related messages. It describes what actors are and how use cases (goals) can be associated to those actors. Finally, it associates specific HL7 messages with these use cases.

There are nine use cases defined in Chapter 2 of the CDC IG. Of the seven use cases listed in the CDC IG, five will be supported by Vermont Immunization Messaging:

Use Case	Goal
Send Immunization History	To send an immunization history for an individual client from EHR system to IIS. In addition to EHR and IIS, other systems such as vital records systems or billing systems could use this message to send immunization histories.
Receive Immunization History	To receive an unsolicited immunization history from an EHR. It may be an update or a new record.
Send Demographic Data	To send demographic data about a person. It may be an update or a new record.
Accept Demographic Data	To accept demographic data about a person. It may be an update or a new record.
Acknowledge Receipt	To acknowledge receipt of a message. This can be an immunization history, request for immunization history, demographic update, observation report or request for personal id. It may indicate success or failure. It may include error messages.
Report Error	To send error messages related to messages.

For detailed specifics about each use case, please refer to Chapter 2 of the CDC IG.

3. HL7 Data Types

The CDC IG contains clearly defined HL7 data types which are the building blocks of an HL7 message. Similar to the terms and definitions found in the HL7 Messaging Infrastructure section above, this guide will avoid potentially ambiguous situations and not attempt to redefine an already clearly defined section. This guide will adhere to chapter 4 of the CDC IG.

4. Usage Codes for Fields

Usage Code	Interpretation	Comment
R	Required	A conforming sending application shall populate all "R" elements with a non-empty value. Conforming receiving application shall process or ignore the information conveyed by required elements. A conforming receiving application must not raise an error due to the presence of a required element, but may raise an error due to the absence of a required element.
RE	Required but may be empty	The element may be missing from the message, but must be sent by the sending application if there is relevant data. A conforming sending application must be capable of providing all "RE" elements. If the conforming sending application knows the required values for the element, then it must send that element. If the conforming sending application does not know the required values, then that element will be omitted. Receiving applications will be expected to process or ignore data contained in the element, but must be able to successfully process the message if the element is omitted (no error message should be generated because the element is missing).
C	Conditional	This usage has an associated condition predicate. This predicate is an attribute within the message. If the predicate is satisfied: A conformant sending application must always send the element. A conformant receiving application must process or ignore data in the element. It may raise an error if the element is not present. If the predicate is NOT satisfied: A conformant sending application must NOT send the element. A conformant receiving application must NOT raise an error if the condition predicate is false and the element is not present, though it may raise an error if the element IS present.
CE	Conditional but may be empty	This usage has an associated condition predicate. This predicate is an attribute within the message. If the predicate is satisfied: If the conforming sending application knows the required values for the element, then the application must send the element. If the conforming sending application does not know the values required for this element, then the element shall be omitted. The conforming sending application must be capable of knowing the element (when the predicate is true) for all 'CE' elements. If the element is present, the conformant receiving application shall process or ignore the values of that element. If the element is not present. The conformant receiving application shall not raise an error due to the presence or absence of the element. If the predicate is not satisfied: The conformant sending application shall not populate the element. The conformant

		receiving application may raise an application error if the element is present.
O or blank	Optional	This element may be present but is not required.
X	Not supported	The element is not supported. Sending applications should not send this element. Receiving applications should ignore this element if present. A receiving application may raise an error if it receives an unsupported element. Any profile based on this Guide should not specify use of an element that is not supported in this Guide.

5. Segments and Message Details

This chapter describes each of the messages used to accomplish the use cases described in Chapter 2. The Segments are built using the Data Types specified in Chapter 4. Readers are referred to these chapters for specifics on these components. Issues related to segments and fields which are message specific will be addressed in this chapter.

Specific to the Vermont Implementation of HL7 messaging, an ADT message will be required whenever a VXU message is sent. The ADT message is necessary for adherence to patient matching requirements of the Vermont Master Patient Index (MPI). Demographic information in addition to what is collected in a standard VXU message may be sent and used for other state programs (e.g. Vermont Blueprint for Health). For ADT messaging requirements please refer to the ADT interface specification (available at www.vitl.net/support).

VXU MESSAGE

MSH

#	Description	value	Required	Validation
1	Field Separator		R	
2	Encoding Characters	^~\&	R	
3	Sending Application	TBD	R	
4	Sending Facility	TBD	R	
5	Receiving Application	Medicity	RE	
6	Receiving Facility	VITL	RE	
7	Date/Time of Message		R	Date /time precision minimum must be to the minute. YYYYMMDDHHMM
8	Security			
9.1	Message Code	VXU	R	
9.2	Trigger Event	V04	R	
9.3	Message structure	VXU_V04	R	
10	Message Control ID	Sequence Number	R	
11	Processing ID	P	R	
12	Version ID	2.5.1	R	
13	Sequence Number			
14	Continuation Pointer			
15	Accept Acknowledgement Type			
16	Application Acknowledgment Type	AL	RE	

PID

#	Description	value	Required	Validation
1	Set ID	1	R	
3.1	Patient Identifier List	Person	R	
3.5	Identifier Type Code			'MR' = Medical Record Number, 'SS' = Social Security Number, "SR" = VITL CMPI
4	Alternate Patient ID		X	
5.1	Patient Name – Last	Person	R	
5.2	Patient Name – First	Person	R	
5.3	Patient Name – Middle	Person	RE	
5.4	Patient Name – Suffix	Person		I, II, III, IV, IX, JR, SR, V, VI, VII, VIII, X
6	Mother's Maiden Name	Person	RE	
7	Date/Time of Birth	Person	R	Date must be prior or equal to the current date, and precision minimum to the day. YYYYMMDD[HH[MM]]
8	Administrative Sex	Person	R	F, M, U
9	Patient Alias		X	
10	Race		RE	1002-5, 2028-9, 2054-5, 2076-8, 2106-3, 2131-1 Repeat if necessary
11.1	Patient Address - Street		R	
11.2	Patient Address – Street2			
11.3	Patient Address – City		R	Two digit state, five digit zip code and city combination must be valid according to USPS. The city name must be an "acceptable" name or abbreviation according to USPS.
11.4	Patient Address – State		R	Two digit state, five digit zip code and city combination must be valid according to USPS. The city name must be an "acceptable" name or abbreviation according to USPS.
11.5	Patient Address – Zip		R	Two digit state, five digit zip code and city combination must be valid according to USPS. The city name must be an "acceptable" name or abbreviation according to USPS.
11.6	Patient Address – Country			Use 3-character (alphabetic) form of ISO 3166.
11.7	Patient Address – Type	M		
11.8	Patient Address – Other			
11.9	Patient Address – County			Five digit county code must exist within FIPS_StatePlaceCounty
12	County Code			
13.2	Home Phone – Use	PRN		
13.3	Home Phone – Type	PH		
13.4	Home Phone – Email			
13.5	Home Phone – Country			
13.6	Home Phone – Area Code			Number must be three numeric digits only
13.7	Home Phone – Number			Number must be seven numeric digits only

14.2	Business Phone – Use			
14.3	Business Phone – Type	PH		
14.4	Business Phone – Email			
14.5	Business Phone – Country			
14.6	Business Phone – Area Cd			Number must be three numeric digits only
14.7	Business Phone – Number			Number must be seven numeric digits only
15	Primary Language			
16	Marital Status			A, B, C, D, G, I, L, M, P, R, S, U, W
17	Religion			
18	Patient Account Number			
19	SSN Number – Patient			Use PID-3 instead
20	Driver’s License Number			
21	Mother’s Identifier			
22	Ethnic Group		RE	H, N, U
23	Birth Place			
24	Multiple Birth Indicator		RE	N, Y
25	Birth Order			Must be numeric
26	Citizenship			
27	Veterans Military Status			
28	Nationality			
29	Patient Death Date and Time		C(RE)	Date must be prior to the current date and precision minimum to the year. YYYY[MM[DD[HH[MM]]]] Must be present if field 30 contains a value of Y
30	Patient Death Indicator		RE	N, Y Enter Y if field 29 contains a Patient Death Date.
31	Identity Unknown Indicator			
32	Identity Reliability Code			
33	Last Update Date/Time			Date must be prior to the current date and precision minimum to the day. YYYYMMDD[HH[MM]]

PD1

#	Description	value	Required	Validation
1	Living Dependency			
2	Living Arrangement			
3.1	Patient Primary Care Facility – Organization Name		X	
3.6	Patient Primary Care Facility – Assigning Authority	'CDC'	R	
3.7	Patient Primary Care Facility – Identifier Type Code	'VACMANPIN'	R	
3.10	Patient Primary Care Facility – Organization Identifier	VACMANPIN Number	R	The VACMAN pin number as assigned by VDH

NK1 (segment must be sent if data is available, otherwise optional)

#	Description	value	Required	Validation
1	Set ID	Sequential number for each NK1 segment, starting with 1	R	Numeric
2.1	Name – Last Name		R	
2.2	Name – First Name		R	
2.3	Name – Middle Name		RE	
2.4	Name – Suffix			I, II, III, IV, IX, JR, SR, V, VI, VII, VIII, X
3	Relationship		R	Value set HL7 0063

ORC

#	Description	value	Required	Validation
1	Order Control	Must be 'RE'	R	
2	Placer Order Number		RE	
3.1	Filler – Order Number		R	If no order ID then value "No Order ID"
3.2	Filler – Organization			
4	Placer Group Number			
5	Order Status			
6	Response Flag			
7	Quantity/Timing			
8	Parent			
9	Date/Time of Transaction			
10	Entered By		RE	
11	Verified By			
12	Ordering Provider		RE	

RXA

#	Description	value	Required	Validation
1	Give Sub-ID Counter	0	R	
2	Administration Sub-ID Counter	1	R	
3	Date/Time Start of Administration		R	Date must be prior or equal to the current date and precision minimum to the day. YYYYMMDD[HH[MM]] Date must be greater than or equal to Patient DOB
4	Date/Time End of Administration		RE	If present, same as RXA-3
5.1	Administered – Code	Vaccine	R	Must be valid CVX code.
5.2	Administered – Name	Vaccine		
5.3	Administered – Type	Must be 'CVX'		
6	Administered Amount	If administered amount is not recorded, use 999.	R	
7	Administered Units		CE	If previous field is populated by any value except 999, it is required.
8	Administered Dosage Form			
9	Administration Notes	Current: 00^new immunization^NIP001 Historical: 01^historical record^NIP001		The primary use of this field is to convey if this immunization record is based on a historical record or was given by the provider recording the immunization.
10	Administering Provider		RE	
11	Administered-at Location		RE	

12	Administered Per			
13	Administered Strength			
14	Administered Strength Units			
15	Substance Lot Number		C	
16	Substance Expiration Date			Precision minimum to the month. YYYYMM[DD][HH[MM]]
17.1	Manufacturer – Code		C	Must be valid MVXCode.
17.2	Manufacturer – Name			
17.3	Manufacturer – Type			
18	Substance/Treatment Refusal Reason			VDH will validate this field if present.
19	Indication			
20	Completion Status		RE	
21	Action Code – RXA	Currently VDH is only accepting A. Action codes of U and D must be handled by EHR/Practice.	RE	A
22	System Entry Date/Time	Intervention		Date must be prior or equal to the current date and precision minimum to the day. YYYYMMDD[HH[MM]]

RXR (used only for current vaccinations)

#	Description	value	Required	Validation
1.1	Route – Code		R	ID, IM, NS, IV, PO, SC, TD
1.2	Route – Description			
1.3	Route – Codeset	HL70162		
2.1	Administration Site – Code		R	LA, LD, LG, LLFA, LT, LVL, RA, RD, RG, RLFA, RT, RVL
2.2	Administration Site – Description			
2.3	Administration Site – Codeset	HL70163		

OBX - Varicella History (segment must be sent if data is available, otherwise optional)

#	Description	value	Required	Validation
1	Set ID	(Auto ID)	R	
2	Value Type	CE	R	
3.1	Observation ID – Code	59784-9	R	
3.2	Observation ID – Description	Disease with presumed immunity		
3.3	Observation ID – Codeset	LN		
4	Observation Sub-ID	1		
5.1	Observation Value – Code	38907003	R	
5.2	Observation Value – Description	History of Varicella infection		
5.3	Observation Value – Codeset	SCT		
6	Units			
7	Reference Range			
8	Abnormal Flags			
9	Probability			
10	Nature of Abnormal Test			
11	Observation Result Status	F	R	
12	Effective Date of Reference Range			
13	User Defined Access Checks			
14	Date/Time of Observation	VaricellaHistory	RE	Date must be prior or equal to the current date and precision minimum to the month. YYYYMM[DD][HH[MM]]

15	Producer's Reference			
16	Responsible Observer			
17.1	Observation Method – Code	VXC41	R	
17.2	Observation Method – Description	per visit		
17.3	Observation Method – Codeset	CDCPHINVS		

OBX – VFC Eligibility (segment must be sent if data is available, otherwise optional)

#	Description	value	Required	Validation
1	Set ID	(Auto ID)	R	
2	Value Type	CE	R	
3.1	Observation ID – Code	64994-7	R	
3.2	Observation ID – Description	Vaccine fund pgm elig cat		
3.3	Observation ID – Codeset	LN		
4	Observation Sub-ID	1		
5.1	Observation Value – Code	VFC Eligibility Code	R	V01, V02, V03, V04, V05, V07
5.2	Observation Value – Description	VFC Eligibility Description		
5.3	Observation Value – Codeset	HL70064		
6	Units			
7	Reference Range			
8	Abnormal Flags			
9	Probability			
10	Nature of Abnormal Test			
11	Observation Result Status	F	R	
12	Effective Date of Reference Range			
13	User Defined Access Checks			
14	Date/Time of Observation	Should be the same as the vaccination date	RE	Date must be prior or equal to the current date and precision minimum to the day. YYYYMMDD[HH[MM]]
15	Producer's Reference			
16	Responsible Observer			
17.1	Observation Method – Code	VXC40	R	
17.2	Observation Method – Description	per immunization		
17.3	Observation Method – Codeset	CDCPHINVS		

OBX – VIS Material, CVX Type (segment must be sent if data is available, otherwise optional)

#	Description	value	Required	Validation
1	Set ID	(Auto ID)	R	
2	Value Type	CE	R	
3.1	Observation ID – Code	30956-7 or 38890-0	R	
3.2	Observation ID – Description	“Vaccine type” or “Component vaccine type”		
3.3	Observation ID – Codeset	LN		
4	Observation Sub-ID	Group ID (links related VIS Material Observation Segments)		Group ID links related VIS Material Observation Segments
5.1	Observation Value – Code	CVX Code	R	Must be valid CVX Code
5.2	Observation Value – Description	CVX Description		
5.3	Observation Value – Codeset	CVX		
6	Units			
7	Reference Range			
8	Abnormal Flags			
9	Probability			
10	Nature of Abnormal Test			
11	Observation Result Status	F	R	

OBX – VIS Material, Publication Date (segment must be sent if data is available, otherwise optional)

#	Description	value	Required	Validation
1	Set ID	(Auto ID)	R	
2	Value Type	TS	R	
3.1	Observation ID – Code	29768-9	R	
3.2	Observation ID – Description	VIS Publication Date		
3.3	Observation ID – Codeset	LN		
4	Observation Sub-ID	Group ID (links related VIS Material Observation Segments)		
5	Observation Value	VIS Material's Publication Date	R	Date must be prior or equal to the current date and precision minimum to the month. YYYYMM[DD][HH[MM]]]
6	Units			
7	Reference Range			
8	Abnormal Flags			
9	Probability			
10	Nature of Abnormal Test			
11	Observation Result Status	F	R	

OBX – VIS Material, Presentation Date (segment must be sent if data is available, otherwise optional)

#	Description	value	Required	Validation
1	Set ID	(Auto ID)	R	
2	Value Type	TS	R	
3.1	Observation ID – Code	29769-7	R	
3.2	Observation ID – Description	VIS Presentation Date		
3.3	Observation ID – Codeset	LN		
4	Observation Sub-ID	Group ID (links related VIS Material Observation Segments)		
5	Observation Value	Date the VIS material was presented to the patient	R	Date must be prior or equal to the current date and precision minimum to the day. YYYYMMDD[HH[MM]]
6	Units			
7	Reference Range			
8	Abnormal Flags			
9	Probability			
10	Nature of Abnormal Test			
11	Observation Result Status	F	R	

Note that if VIS materials are given for a combination vaccine, there will an OBX segment for CVX Type, Publication Date and Presentation Date for each VIS Material given, all with the same Group ID

Appendix A: Guidance on Usage and Example Messages

Please note that validation requirements listed above should be followed very closely for both message types, otherwise messages will be rejected.

SAMPLE VXU MESSAGE

```
MSH|^~\&|MEDICITY|168000|VDH|VDH|20130417124803||VXU^V04^VXU_V04|168000_20
130417-3560|P|2.5.1||AL
PID|1||22711||Person^Test^A||20130101|M||2106-3^White^hl70005|1 Pleasant
Rd^^Putney^VT^05346||^555^5551234|^555^5555678|||||N
PD1|||Cornerstone Pediatrics^^BMH^^CDC^VACMANPIN^^68301
NK1|1|Person^Matron|MTH^Mother
ORC|RE||12345
RXA|0|1|20130417|20130417|62^HPV^CVX|05|1||00^New immunization
record^NIP001|^Sally^Nurse||||H016238|20150411|MSD^Merck Co., Inc.^MVX
RXR|IM^Intramuscular^HL70162|LD^Left Deltoid^HL70163
OBX|1|CE|64994-7^Vaccine fund pgm elig cat^LN|1|V02|||||F|||||VXC40
OBX|2|CE|30956-7^Vaccine type^LN|2|62|||||F
OBX|3|TS|29768-9^VIS Publication Date^LN|2|20120222|||||F
OBX|4|TS|29769-7^VIS Presentation Date^LN|2|20130417|||||F
ORC|RE||12346
RXA|0|1|20110104||110^DTAP-Hep B-IPV^CVX|999|||01^historical record^NIP001
```