



CAIR2 HL7 v2.5.1 VXU Implementation Guide

California Immunization Registry

Version 3.10

Consistent with

*HL7 Version 2.5.1 Implementation Guide
for Immunization Messaging, Release 1.5*

October 23, 2019

REVISION HISTORY

Editor	Edit Date	Version	Changes
E. Dansby	July 28, 2016	1.0	
S. Nickell	August 3, 2016	1.01	<ul style="list-style-type: none"> • ACK clarifications
E. Dansby	August 16, 2016	3.0	
E. Dansby	October 12, 2016	3.01	<ul style="list-style-type: none"> • PID-13 changed to R from RE • PID-22.3 table name changed to CDCREC • RXA-10.9 changed to 'R' if RXA-10.1 is valued • RXA-10.13 changed to 'R' if RXA-10.1 is valued
S. Nickell	November 15, 2016	3.02	
E. Dansby	December 01, 2016	3.03	<ul style="list-style-type: none"> • Added text NOTE to clarify inventory decrementing • Added ORC-17 (RE) to Master Field list table with description • Change PID-25 usage to 'C' • Changed PID-3.4 to 'R' and noted error will be informational. • Added descriptive text under NK1 Segment Details section, regarding the NK1 required fields. • Added note re: inventory decrementing under the RXA Segment details. • Added Comment column to MSA-1 ACK code table
S. Nickell	January 30, 2017	3.04	<ul style="list-style-type: none"> • Name change
E. Dansby	February 15, 2017	3.04	<ul style="list-style-type: none"> • Added RXA-5.1 to Requirements for inventory decrementing table • Added PID-29 and PID-30 to Master Field List and PID segment details • Changed all MSH-15 and MSH-16 instances to 'RE' from 'R', along with description if MSH-16 is empty • Added details on PD1-16 and PD1-17 under the PD1 Segment details • Removed NDC code acceptance for this release of CAIR2.
S. Nickell	September 17, 2018	3.05	<ul style="list-style-type: none"> • Added independent registry region codes in anticipation of data sharing
E. Dansby	December 31, 2018	3.06	<ul style="list-style-type: none"> • Added code for non-binary administrative sex • Removed topic "F." from "Moving from CAIR1 to CAIR2 – Important Changes" as it no longer applied • Added language to RXA-5 description

E Dansby	October 23, 2019	3.10	<ul style="list-style-type: none">• Added language to RXA-10 description• Added language to ORC section• Removed outdated text that no longer applied to this document• Updated web links
----------	------------------	------	--

CAIR DATA EXCHANGE CONTACT INFORMATION

For data exchange questions and support, please email CAIRDataExchange@cdph.ca.gov.

To get the latest information regarding data exchange with CAIR2, please visit the data exchange page on the CAIR website at: <http://cairweb.org/data-exchange/>

TABLE OF CONTENTS

REQUIRMENTS FOR INVENTORY DECREMENTING IN CAIR2	7
HL7 VXU FILE FORMAT AND CONTENT	8
MASTER FIELD LIST	10
SEGMENT DETAILS	14
MSH: Message Header Segment	14
MSH-1: Field separator	14
MSH-2: Encoding characters	14
MSH-4: Sending facility ID	15
MSH-6: Receiving Facility	15
MSH-7: Date/time of message	15
MSH-9: Message type	15
MSH-10: Message Control ID	16
MSH-11: Processing ID	16
MSH-12: Version ID	16
MSH-16: Application acknowledgment type	16
MSH-22: Sending Responsible Organization	16
PID: Patient Identifier Segment	16
PID-3: Patient identifier list	18
PID-5: Patient name	18
PID-6: Mother's maiden name	19
PID-7: Date of birth	19
PID-8: Sex	19
PID-10: Race	19
PID-11: Patient address	20
PID-13: Phone number – home	20
PID-15: Primary language	21
PID-22: Ethnic Group	21
PID-24: Multiple Birth Indicator	21
PID-25: Birth Order	21
PID-29: Patient Death Date and Time	21
PID-30: Patient Death Indicator	21
PD1: Additional Demographics Segment	22
PD1-11: Publicity code	22
PD1-12: Protection Indicator	23
PD1-13: Protection Indicator Effective Date	24
PD1-16: Immunization Registry Status	24
PD1-17: Immunization Registry Status Effective Date	24
NK1: Next of Kin Segment	24
NK1-1: Set ID	24
NK1-2: Name	25
NK1-3: Relationship	25
NK1-4: Address	25
NK1-5: Phone Number	25
ORC: Order Control Segment	26
ORC-1: Order Control	26
ORC-2: Placer Order Number	26
ORC-3: Filler Order Number	26
ORC-10: Entered By	26

ORC-12: Ordering Provider	27
ORC-17: Entering Organization	27
RXA: Pharmacy/Treatment Administration Segment	28
RXA-1: Give sub ID counter	28
RXA-2: Administration sub-ID counter	29
RXA-3: Date/time start of administration	29
RXA-5: Administered code	29
RXA-6: Administered amount	29
RXA-7: Administered units	30
RXA-9: Administration notes	30
RXA-10: Administering provider	30
RXA-11: Administered at location	31
RXA-15: Substance lot number	31
RXA-16: Substance expiration date	31
RXA-17: Substance manufacturer	32
RXA-20: Completion Status	32
RXA-21: Action code	32
RXR: Pharmacy Route Segment	33
RXR-1: Route	33
RXR-2: Site	33
OBX: Observation Segment	34
OBX-1: Set ID – OBX	34
OBX-2: Value Type	34
OBX-3: Observation Identifier	34
OBX-4: Observation Sub-ID	35
OBX-5: Observation Value (VFC eligibility)	35
OBX-14: Date/Time of the Observation	35
HL7 ACK FILE FORMAT AND CONTENT	36
CAIR2 ACK Segment Structure	36
MSH – Message Header Segment	36
MSA – Message Acknowledgment Segment	36
ERR – Error Segment	37
APPENDIX A	39
CAIR Receiving Facility (Region) Codes for MSH-6	39

OVERVIEW

The California Immunization Registry (CAIR2) is a secure, confidential, statewide computerized immunization information system for California residents. The goal of CAIR2 is to improve immunization rates for all California children through an innovative public-private partnership. CAIR2 is a collaborative effort involving regional immunization registry services, with the support of their local health departments, the California Department of Public Health Immunization Branch, and a spectrum of key stakeholders across the state.

Participation in CAIR2 is voluntary and is open to healthcare providers, schools, child care facilities, county welfare departments, family child care homes, foster care agencies, WIC service providers, and health care plans. To participate, users must sign a confidentiality agreement stating they will maintain the confidentiality of the patient immunization information and will only use the information to provide patient care or to confirm that childcare or school immunization requirements have been met.

This specification document was written as an “easy to read and implement” guide. The finer details and explanations of HL7 have been simplified. The guide is intended to provide the necessary information for the exchange of immunization records between CAIR2 and external health providers.

The recommendations listed in this implementation guide are in line with the CDC document [HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5](https://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf) (URL: <https://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf>)

All tables referenced in this guide can be found in the appendix of the CDC implementation guide.

BI-DIRECTIONAL CAPABILITY – QBP/RSP

CAIR2 supports real-time immunization record query messages (QBP) and will return immunization histories or immunization histories plus forecasting in a response file (RSP).

The CAIR2 BiDX Implementation Guide can be downloaded from the CAIR website, www.cairweb.org/bidx.

Sites interested in BiDX are required to complete an online [CAIR2 Bidirectional Interest/Readiness survey](#) as a first step in the BiDX onboarding process.

To get the most value from the BiDX process, each site should consider submitting all active patient historical doses to CAIR2 so that patient vaccination recommendations returned to your EHR will be correct. Consult with one of our [CAIR2 Data Exchange Specialists](#) about submitting prior immunizations records (historical data) for your active patients.

SENDING VXU DATA TO CAIR

CAIR2 accepts unsolicited HL7 v2.5.1 vaccination record updates (VXU) in real time. CAIR2 uses SOAP web services as the transport mechanism. Details regarding the SOAP format can be found in the [CAIR2 VXU Test Plan](#) found on the data exchange tech support page: <http:// Cairweb.org/data-exchange/>.

REQUIRMENTS FOR INVENTORY DECREMENTING IN CAIR2

Provider sites will now have the ability to have vaccine doses decrement from inventory in CAIR2 through data exchange. In order for the inventory to decrement correctly in CAIR2:

Inventory with matching lot number and funding source need to exist in CAIR2,

The following fields in the RXA and OBX segment of the HL7 message must be populated accurately.

See details beginning on page 29.

Segment / Field	Data Element	Comments
MSH-22	Responsible Sending Org	CAIR site ID in MSH-22, must match the CAIR site ID of the site where the vaccine inventory will be drawn from.
RXA-5.1	Administration Code	Vaccine code submitted must match vaccine in the CAIR2 inventory
RXA-9.1	Administered Notes	Must be coded as a given shot. Not historical.
RXA-11.4	Administered-at Location	CAIR site ID in this field must match the CAIR site ID in MSH-22.
RXA-15	Substance Lot Number	Vaccine lot number sent must match lot number in CAIR2 inventory
RXA-20	Completion Status	Must be 'CP', 'PA', or empty.
RXA-21	Action Code	Must be 'A' or 'U'
OBX-5.1	Observation Value	VFC Funding Eligibility Category sent in this field must match with the funding category of the vaccine lot in the CAIR2 inventory

NOTE: By default, the inventory decrementing feature for all CAIR2 sites is set to 'NO'. Sites wishing to use the inventory decrementing feature in CAIR2 must contact and coordinate with a Data Exchange Specialist at CAIR before the decrementing feature is activated.

HL7 VXU FILE FORMAT AND CONTENT

Unsolicited Vaccination Update (VXU)

All immunization messages should be sent as a VXU type HL7 message. Regardless of whether the message contains a new record or an update to an existing record, CAIR2 requires a full VXU message to be sent with all required fields populated. A full VXU message should be generated by the sending system for any updates to existing patient records, and should contain all required segments, components, and subcomponents of a full message.

VXU Message Structure (Ignored segments not shown)

Segment	Cardinality	Description	Usage	Notes
MSH	[1..1]	Message Header	R	Every message begins with an MSH.
PID	[1..1]	Patient Identification	R	Every VXU requires one PID segment.
PD1	[1..1]	Patient Additional Demographics	R	Every PID segment must have one PD1 segment. Required for CAIR Disclosure information.
[[NK1]]	[0..*]	Next of Kin/Associated Parties	RE	PID segment in a VXU may have zero or more NK1 segments.
{			R	Begin Order Group – Each VXU must contain at least one Order Group
ORC	[1..*]	Order Request	R	Each RXA requires exactly one ORC
RXA	[1..1]	Pharmacy/Treatment Administration	R	Each ORC requires exactly one RXA
[RXR]	[0..1]	Pharmacy/Treatment Route	RE	Every RXA segment in a VXU may have zero or one RXR segment.
[[OBX]]	[0..*]	Observation/Result	RE	Every RXA segment in a VXU may have zero or more OBX segments.
}				End order segment

NOTE: [XYZ] Square brackets enclose optional segments
 {XYZ} Curly brackets enclose segments which can be repeated
 [[XYZ]] Defines an optional segment which can be repeated

SAMPLE VXU MESSAGE

The following sample message contains one RXA segment. The CAIR provider site ID (and sending ID) is identified as DE-000001 and the data is coming from their internal system called MyEMR. The file was sent on July 1, 2016. The file is using HL7 version 2.5.1 and the message ID is CA0001. The patient is George M. Jones, Jr., a white male with a patient ID of PA123456 and a birth date of 02/27/2014. His mother's maiden name is Martha G. Miller. His address is 1234 W First St in Beverly Hills, CA, 90210. His home number is 555-555-5555. His primary language is English, and he is the second child in a multiple-birth.

The publicity code is set for reminder/recall, any method, and his protection indicator is set to N, with an effective date of 7/30/2014. His mother is the identified guardian in the record, and her married name is the same as the patient's.

One vaccination record is recorded, a new immunization of Hep B given by the primary provider on 7/30/2014 with a dosage amount of .5 mL and a lot number of 0039F. The vaccine lot expires on 05/31/2020. The manufacturer is Merck and the vaccination was recorded as a completed shot (CP) and is marked as an "add" or new record. The vaccine was given as intramuscular in the left arm of the patient. The immunization was ordered by Janet Smith, MD and Dave Clark entered the information into the EMR (MyEMR). The patient is VFC eligible and the patient's VFC eligibility status is uninsured.

Here is the sample HL7 message. Note that indentation has been added to each segment for readability.

```
MSH|^~\&|MyEMR|DE-000001| |CAIRLO|20160701123030-
  0700||VXU^V04^VXU_V04|CA0001|P|2.5.1|||ER|AL|||Z22^CDCPHINVS|DE-000001
PID|1||PA123456^^^MYEMR^MR||JONES^GEORGE^M^JR^^L|MILLER^MARTHA^G^^^M|20140227|M||21
  06-3^WHITE^CDCREC|1234 W FIRST ST^^BEVERLY
  HILLS^CA^90210^^H|^PRN^PH^^555^5555555||ENG^English^HL70296|||2186-5^ not Hispanic or
  Latino^CDCREC||Y|2
PD1|||02^REMINDER/RECALL – ANY METHOD^HL70215|N|20140730||A|20140730|
NK1|1|JONES^MARTHA^^^L|MTH^MOTHER^HL70063|1234 W FIRST ST^^BEVERLY
  HILLS^CA^90210^^H|^PRN^PH^^555^5555555|
ORC|RE||197023^CMC|||^Clark^Dave||1234567890^Smith^Janet^^^^^NPPES^L^^^NPI^^^^^^MD
RXA|O|1|20140730||08^HEPB-PEDIATRIC/ADOLESCENT^CVX|.5|mL^mL^UCUM||00^NEW IMMUNIZATION
  RECORD^NIP001|1234567890^Smith^Janet^^^^^NPPES^^^^NPI^^^^^^MD|^DE-
  000001|||0039F|20200531|MSD^MERCK^MVX||CP|A
RXR|C28161^INTRAMUSCULAR^NCIT|LA^LEFT ARM^HL70163
OBX|1|CE|64994-7^Vaccine funding program eligibility category^LN|1|V03^VFC eligibility –
  Uninsured^HL70064|||F||20110701140500
```

MASTER FIELD LIST

The Master Field List shows every field accepted by CAIR2 in one table. For more details on each field see the documentation under the segment and field description. Use this table as a quick reference, but read the expanded segment documentation for more complete information. A few pointers on reading the table:

- Usage column code interpretations:
 - **R – Required:** A conforming sending application shall populate all “R” elements with a non-empty value
 - **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. If the sending application does not know the required values, then that element may be omitted.
 - **O – Optional:** CAIR may read or use the information, but does not require it to be sent. Please send values for optional fields if they are available.
 - **C – Conditional:** The usage code has an associated condition predicate that determines the operational requirements (usage code) of the element.
- **All HL7 Code Tables referenced in this document are from the CDC document *HL7 Version 2.5.1 Implementation Guide for Immunization Messaging v1.5*** and can be viewed or downloaded from <http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html>
- The order of the segments in the table align with the standard VXU message structure

Segment / Field	Data Element	Usage	HL7 Code Table	Comment
MSH-1	Field Separator	R		Required value is
MSH-2	Encoding Characters	R		Required values ^~\&
MSH-4	Sending Facility	R		Required in MSH segment. Sending facility ID supplied by CAIR.
MSH-6	Region Code	R		Region Code Value – See Appendix A
MSH-7	Date/time of message	R		
MSH-9	Message type	R		VXU^V04^VXU_V04
MSH-10	Message control ID	R		Used to tie acknowledgement to message
MSH-11	Processing ID	R		Required by HL7. Constrain to ‘P’. Empty field or any other value will cause the message to be rejected.
MSH-12	HL7 Version ID	R	HL70104	Version 2.5.1 only
MSH-15	Accept Acknowledgement Type	RE	HL70155	
MSH-16	Application Acknowledgement Type	RE	HL70016	If blank, MSH-16 acts as ‘ER’.
MSH-21	Message Profile Indicator	RE		Sites may use this field to assert adherence to, or reference, a message profile.

Segment / Field	Data Element	Usage	HL7 Code Table	Comment
MSH-22	Responsible Sending Org	RE		Value of MSH-22 should be the CAIR Site ID of the 'Sending Responsible Organization' who administered the immunization (in most cases, use the RXA-11.4 value). If MSH-22 is empty, the value in RXA-11.4 will be used as the 'sending responsible organization'. If both MSH-22 and RXA-11.4 are empty, the record will be rejected.
PID-3	Patient ID	R		This is the patient ID from the provider's system, commonly referred to as medical record number. CAIR2 only accepts type codes, 'MR', 'PI', 'PN', 'PRN', or 'PT'
PID-5	Patient Name	R		Each name field has a 50 character length limit in CAIR2
PID-6	Mother's Maiden Name	RE		
PID-7	Date of Birth	R		YYYYMMDD
PID-8	Sex	R	HL70001	'M', 'F', 'X' or 'U' only
PID-10	Race	RE	HL70005	
PID-11	Patient Address	RE		
PID-13	Home Phone Number	RE		
PID-15	Primary Language	RE	HL70296	To ensure correct translation, please use the proper code for the HL7 version of the message.
PID-22	Ethnic Group	RE	HL70189	Used to further identify race as Hispanic or non-Hispanic
PID-24	Multiple Birth Indicator	RE	HL70136	'Y', 'N', or blank. Empty value is treated as 'N' in CAIR.
PID-25	Birth Order	C(R/O)		If PID-24 = 'Y' a birth order number (1, 2, 3, etc...) must be entered.
PID-29	Patient Death Date and Time	C(RE/X)		If PID-30 is valued 'Y'
PID-30	Patient Death Indicator	RE	HL70136	Field indicates whether the patient is deceased. Values are either 'Y', 'N', or empty.
PD1-11	Publicity Code	RE	HL70215	Indicates reminder/recall intentions. A blank value will default to 'Y' in CAIR.
PD1-12	Protection Indicator	R		'Y', 'N'. Indicates whether patient data should be 'locked' so other CAIR providers can't view.
PD1-13	Protection Indicator Effective Date	C(R/O)		Required if PD1-12 is supplied.
PD1-16	Immunization Registry Status	RE	HL70441	Current status of the patient in relation to the sending provider organization
PD1-17	Immunization Registry Status Effective Date	C(RE/X)		Date for the registry status reported in PD1-16. If PD1-16 is valued.

Segment / Field	Data Element	Usage	HL7 Code Table	Comment
NK1-1	Set ID	R		Empty value will cause the NK1 segment to be ignored
NK1-2	Next of Kin Name	R		Name of next of kin or associated party
NK1-3	Relationship	R	HL70063	Personal relationship that the next of kin or associated party has to the patient.
ORC-1	Order Control	R		Constrain to "RE"
ORC-2	Placer Order Number	RE		Uniquely identifies the order among all orders sent by a provider organization
ORC-3	Filler Order Number	RE		Uniquely identifies the order among all orders sent by a provider organization that filled the order
ORC-10	Entered By	RE		This is the person that entered the immunization record into the system.
ORC-12	Ordering Provider	RE		This shall be the provider ordering the immunization. It is expected to be empty if the immunization record is transcribed from an historical record.
ORC-17	Entering Organization	RE		If populated, use CAIR site ID in ORC-17.1
RXA-1	Give Sub-ID counter	R		Constrain to '0' (zero)
RXA-2	Administration Sub-ID counter	R		Constrain to '1' (one).
RXA-3	Date/Time Start of Administration	R		YYYYMMDD
RXA-5	Administration Code	R		CVX or NDC codes accepted. Sending both codes together in the RXA-5 field is not accepted in CAIR2 at this time.
RXA-6	Administered Amount	R		Required for all doses. If the amount is unknown, then the value '999' must be placed in this field. Comma separators are not allowed in this field.
RXA-7	Administered Units	C(RE/O)		If RXA-6 is supplied, unit value should be 'mL^mL^UCUM'.
RXA-9	Administered Notes	R	NIP001	Indicates historical or given shot.
RXA-10	Administering Provider	C(RE/O)		The person who administered the shot. If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA'.
RXA-11	Administered-at Location	C(R/O)		The provider site where the shot was given. Provider ID supplied by CAIR. If RXA-9.1 = '00' then this field is required.
RXA-15	Substance Lot Number	C(R/O)		If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA', substance lot number must be supplied.
RXA-16	Substance Expiration Date	C(RE/O)		If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA'.
RXA-17	Substance Lot Mfr Name	C(R/O)	HL70227	If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA'. MVX code only.

Segment / Field	Data Element	Usage	HL7 Code Table	Comment
RXA-20	Completion Status	RE	HL70322	Only complete records (CP) and Partial Administrations (PA) are processed. Empty value will be treated as ' CP '.
RXA-21	Action Code	RE	HL71224	Empty value will be treated as ' A '. Values ' A ', ' U ', and ' D ' accepted
RXR-1	Route	RE	HL70162	Route of the administration.
RXR-2	Administration Site	RE	HL70163	Body site of the administration route.
OBX-1	Set ID – OBX	R		Sequence number of the OBX. First instance should be set to '1' (one).
OBX-2	Value Type	R		Should be " CE " – coded element.
OBX-3	Observation Identifier	R	NIP003	Only " 64994-7 " Vaccine funding program eligibility category accepted. All other OBX segments will be ignored.
OBX-4	Observation Sub-ID	R		Required to group related OBX segments
OBX-5	Observation Value	R	HL70064	This is where the code for VFC eligibility will be recorded at the vaccine level.
OBX-11	Observation Result Status	R		Constrain to " F " for final.
OBX-14	Date/Time of the Observation	RE		

SEGMENT DETAILS

MSH: Message Header Segment

The Message Header (MSH) segment is required for each message sent. Multiple messages may be sent back-to-back. MSH segments separate multiple messages.

Position	Field Name	Status
1	Field separator	required
2	Encoding characters	required
3	Sending application	optional
4	Sending facility	required
5	Receiving application	ignored
6	Receiving facility	required
7	Date/time of message	required
8	Security	ignored
9	Message type	required
10	Message control id	required
11	Processing id	required
12	Version id	required
13	Sequence number	ignored
14	Continuation pointer	ignored
15	Accept acknowledgment type	required, but may be empty
16	Application acknowledgment type	required, but may be empty
17	Country code	ignored
18	Character set	ignored
19	Principal language of message	ignored
20	Alternate character set handling scheme	ignored
21	Message Profile Identifier	required, but may be empty
22	Sending Responsible Organization	required, but may be empty

MSH-1: Field separator

CAIR2 expects to receive standard character: '|'

NOTE: The CDC Immunization Guide requires senders to only use the standard character.

MSH-2: Encoding characters

CAIR2 expects standard encoding characters: ^~\&

NOTE: The CDC Immunization Guide requires senders to only use the standard characters.

MSH-4: Sending facility ID

The CAIR2 sending facility ID is assigned automatically after registering through the Immunization Messaging Portal. The ID will be sent to the Site in a secure email. Data submitters will place their assigned CAIR2 Site ID in MSH-4. This assigned ID should be used for all messages sent.

Position	Field Name	Status
1	namespace id	required
2	universal id	ignored
3	universal id type	ignored

MSH-6: Receiving Facility

The receiving facility will be used to indicate the name of the region where the data is being sent. During the transition of CAIR2, region codes will be used to properly route the message to the intended registry region (i.e. if the provider Site is located in Los Angeles County, then the value for MSH-6 will be 'CAIRLO').

NOTE: Use of the region code in MSH-6 will be phased out by April 2017, as all current CAIR1 regions will have been transitioned to CAIR2 and the region code will no longer be required.

Position	Field Name	Status
1	namespace id	required; see Appendix A for values
2	universal id	ignored
3	universal id type	ignored

MSH-7: Date/time of message

The date and time the message was created. This field is required.

Format: YYYYMMDDHHMMSS

If sending more than 14 digits, the following format is required:

YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]

Example: **19970716192030.45+0100**

MSH-9: Message type

The type of message being sent.

Message type: VXU

Trigger event: V04

Message structure: VXU_V04

Position	Field Name	Status
1	message type	required
2	trigger event	required
3	message structure	required

MSH-10: Message Control ID

The Message Control ID is a unique id for the message that is generated by the sending system. This field is used to tie the acknowledgement to the message. **Format:** **STRING**

MSH-11: Processing ID

Required by HL7. **Only value accepted is “P” for production. All other values will cause the message to be rejected.**

MSH-12: Version ID

Value: **2.5.1**

MSH-16: Application acknowledgment type

Indicates whether or not a response should be returned, and if so, under what conditions. Empty MSH-16 will act as ‘ER’

HL7-defined Table 0155 – Accept/Application Acknowledgment conditions

Value	Description	Status
AL	Always	accepted
NE	Never	accepted
ER	Error/Reject conditions only	accepted
SU	Successful completion only	accepted

MSH-22: Sending Responsible Organization

The CAIR2 site ID for the location that ‘owns’ the vaccination should be sent in MSH-22.

The CAIR2 site ID in MSH-22 should match the value sent in RXA-11.4 of a given shot in the HL7 message. For inventory decrementing in CAIR2, the value in MSH-22 will be the CAIR2 site ID where the vaccine was administered. If MSH-22 is empty, the value will default to the CAIR2 site ID sent in RXA-11.4. If there are multiple RXA segments, with multiple CAIR2 site IDs in one message, and MSH-22 is empty, the message will be rejected.

PID: Patient Identifier Segment

The Patient Identifier segment includes essential information for matching an incoming patient record to patient records previously sent by other providers.

Position	Field Name	Status
1	Set id	ignored
2	Patient id	ignored
3	Patient identifier list	required
4	Alternative patient id	ignored
5	Patient name	required
6	Mother's maiden name	required, but may be empty
7	Date/time of birth	required
8	Sex	required
9	Patient alias	ignored
10	Race	required, but may be empty

11	Patient address	required, but may be empty
12	County code	Ignored
13	Phone number - home	required, but may be empty
14	Phone number - business	optional
15	Primary language	required, but may be empty
16	Marital status	ignored
17	Religion	ignored
18	Patient account number	ignored
19	SSN number - patient	ignored
20	Driver's license number - patient	ignored
21	Mother's identifier	ignored
22	Ethnic group	required, but may be empty
23	Birth place	ignored
24	Multiple birth indicator	required, but may be empty
25	Birth order	C (R/O); if PID-24 is valued "Y"
26	Citizenship	ignored
27	Veterans military status	ignored
28	Nationality	ignored
29	Patient death date and time	C (RE/X) If PID-30 is valued "Y"
30	Patient death indicator	required, but may be empty
31	Identify Unknown Indicator	ignored
32	Identity Reliability Code	ignored
33	Last Update Date/Time	optional
34	Last Update Facility	ignored
35	Species Code	ignored
36	Breed Code	ignored

NOTES: Patient Mapping in CAIR2

The CAIR2 system assigns a unique patient ID to each patient in the system. VXU files from providers include demographic information about a patient along with the provider's unique patient identifier. CAIR2 accepts and stores these provider patient IDs and uses them in its matching algorithm in an attempt to uniquely identify patients and prevent duplication of patient information. For this reason, it is very important to provide as much of the demographic data on the patient as possible. The patient name, date of birth, and sex are required fields. Additional information about the parents or guardians—in particular the birth mother name—as well as accurate current address are all used to identify patients. The more information provided, the better the matching process and the less likely it is that a duplicate patient record will be created.

The provider's patient identifier is located in the PID segment, field 3. This is a required field. According to HL7 specification, this field can be repeated, meaning that the provider may send multiple identifiers along with their appropriate identifier types. CAIR2 will only accept patient IDs with an identifier type code of **MR** (medical record number), **PI** (patient internal identifier), **PN** (person number) **PRN** (provider

number), or **PT** (patient external identifier). The identifier should be the one used in the provider's EHR to uniquely identify patients. Other identifier types, including social security number or Medicare number are ignored. It is therefore recommended that the provider include only the accepted types of patient identifiers for each patient and to use that identifier type consistently for all patient records submitted.

PID-3: Patient identifier list

This is the patient ID from the provider's system, commonly referred to as the medical record number.

Warning: The sending system's patient id is a required field. The message will be rejected if this id is not sent or cannot be found in this field. The identifier type code in PID-3.5 is also required and if not submitted the message will be rejected.

Position	Field Name	Status
1	id	required
2	check digit	ignored
3	code identifying the check digit scheme employed	ignored
4	assigning authority	required; if empty, a warning ACK will be returned
5	identifier type code	required
6	assigning facility	ignored

NOTE: CAIR2 only accepts identifier type codes **MR** (medical record number), **PI** (patient internal identifier), **PN** (person number) **PRN** (provider number), or **PT** (patient external identifier) in PID-3.5. Repetitions are accepted in this field.

PID-5: Patient name

The legal name must be sent in the first repetition. The last, first and middle names must be alpha characters only (A-Z). The last name or the given name should not contain the patient's suffix (e.g. JR or III). The given name should not include the patient's middle name or middle initial. These should be sent in their appropriate fields.

WARNING: This message will be rejected if the first and/or last name is missing.

Position	Field	Status
1	family name	required
2	given name	required
3	middle initial or name	required, but may be empty
4	suffix	required, but may be empty
5	prefix	ignored
6	degree	ignored
7	name type code	required, but may be empty
8	name representation code	ignored

NOTE: Repetitions are accepted in this field. The first repetition shall contain the legal name. Values for the name type code field are from HL7-defined Table 0200 – Name type

PID-6: Mother's maiden name

This field should contain the patient's mother's maiden name as well as the mother's first name. **This field is used for patient matching.** If the field is valued, the requirements below must be followed.

Position	Field	Status
1	family name	required
2	given name	required
3	middle initial or name	ignored
4	suffix	ignored
5	prefix	ignored
6	degree	ignored
7	name type code	required, but may be empty
8	name representation code	ignored

NOTE: Values for the name type code field are from HL7-defined Table 0200 – Name type

PID-7: Date of birth

The patient's date of birth. This date is required because it is critical to several functions including immunization recommendations/forecast.

Format: YYYYMMDD

PID-8: Sex

The patient's gender.

Value	Description	Status
F	Female	accepted
M	Male	accepted
X	Non-binary	accepted
U	Unknown	accepted

NOTE: California State legally recognizes "non-binary" as a third gender option. The gender code "X" has become the standard for a non-binary gender option and is currently used on California driver's licenses, has been adopted by the state of Oregon, as well as on official documents issued by foreign countries, including Australia, New Zealand, and Canada.

PID-10: Race

Patient's race is sent in this field. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty; use HL7005

NOTE: Values for the identifier field are from User-defined Table 0005 – Race. Repetitions are accepted in this field.

PID-11: Patient address

The patient's address is sent in this field. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	street address	required
2	other designation	required, but may be empty
3	city	required
4	state or province	required
5	zip or postal code	required
6	country	optional
7	address type	required, but may be empty
8	other geographic designation	ignored
9	county/parish code	optional
10	census tract	ignored
11	address representation code	ignored

PID-13: Phone number – home

The patient's home phone number is sent in this field. If the field is valued, the requirements below must be followed in order for the phone number to post in the CAIR2 application.

Position	Field	Status
1	phone number	optional
2	use code	Required (Warning ACK returned if code invalid or not submitted)
3	equipment type	optional
4	email	C (R/X) If PID-13.2 (telecommunication use code is valued as "NET".
5	country	ignored
6	area	C (RE/X) If PID-13.2 (telecommunication use code is valued not "NET".
7	phone	C (RE/X) If PID-13.2 (telecommunication use code is valued not "NET".
8	extension	ignored
9	any text	ignored

NOTE: Values for the use code are found in table HL70201. Repetitions are allowed in this field. Example PID-13 format: |^PRN^PH^^555^555555|

PID-15: Primary language

The primary language of the patient or responsible party (if child.) This information is used to ensure that the appropriate language is used in mailings or other contacts.

Note: To ensure correct translation, please use the proper identifier code for the HL7 version of the message. HL7 v2.5.1 use ISO 639 available from [PHIN-VADS](https://phinvads.cdc.gov/vads/ViewValueSet.action?id=43D34BBC-617F-DD11-B38D-00188B398520) at (URL: <https://phinvads.cdc.gov/vads/ViewValueSet.action?id=43D34BBC-617F-DD11-B38D-00188B398520>)

If the field is valued, the requirements below must be followed.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty; use HL70296

Note: Currently only **ENG** and **SPA** are accepted language codes.

PID-22: Ethnic Group

This field is for the ethnicity of the patient. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty; use CDCREC

Note: The identifier for ethnicity can be found in CDCREC table – Ethnic Group

PID-24: Multiple Birth Indicator

This field indicates whether the patient was part of a multiple birth. If empty, CAIR2 will default this field to “N”.

Value	Description
Y	The patient was part of a multiple birth
N	The patient was a single birth

Note: Refer to HL7-defined Table 0136 – Yes/No Indicator for valid values.

PID-25: Birth Order

If the patient is part of a multiple birth, a value (number) indicating the patient’s birth order is entered in this field. If PID-24 is populated with a ‘Y’, then this field shall be populated.

PID-29: Patient Death Date and Time

This field contains the date and time at which the patient death has occurred. Must be valued if PID-30 is valued with a ‘Y’.

PID-30: Patient Death Indicator

This field indicates whether the patient is deceased.

PD1: Additional Demographics Segment

The Patient Demographic Segment contains patient demographic information that may change from time to time. CAIR2 uses this segment to indicate whether the person wants to receive reminder/recall notices and whether or not the patient wants his or her data protected.

Position	Field Name	Status
1	Living dependency	ignored
2	Living arrangement	ignored
3	Patient primary facility	ignored
4	Patient primary care provider name & id number	ignored
5	Student indicator	ignored
6	Handicap	ignored
7	Living will	ignored
8	Organ donor	ignored
9	Separate bill	ignored
10	Duplicate patient	ignored
11	Publicity code	required, but may be empty
12	Protection indicator	required
13	Protection indicator effective date	C (R/O) Required if PD1-12 is supplied.
14	Place of worship	ignored
15	Advance directive code	ignored
16	Immunization registry status	required, but may be empty
17	Immunization registry status effective date	C (RE/X) If the PD1-16 field is valued
18	Publicity code effective date	ignored

PD1-11: Publicity code

This field indicates whether the patient wishes to receive reminder/recall notices. Use this field to indicate a specific request from the patient/parent or leave blank. An empty value will be treated the same as a "02" value in this field, meaning that it is OK for a provider site to send reminder/recall notices regarding immunizations to this patient

Position	Field Name	Status
1	identifier	required, but may be empty
2	text	optional
3	name of coding system	required, but may be empty; use HL70215 if valued
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

Note: Values for this field can be found in User-defined Table 0215 – Publicity code

PD1-12: Protection Indicator

This field identifies whether a person’s information may be shared with other CAIR2 users. The protection state must be actively determined by the clinician. CAIR will translate an empty value sent in PD1-12 as **disclosed/agree to share**. (Please see below text for more detailed information regarding disclosure and sharing)

Value in HL7 2.5.1	HL7 Standard
Y	Protect the data. Client (or guardian) has indicated that the information shall be protected. (Do not share data)
N	It is not necessary to protect the data from other clinicians. Client (or guardian) has indicated that the information does not need to be protected. (Sharing is OK)

NOTES: Patient disclosure and sharing

California Immunization Registry Statute Health and Safety Code Section 120440 states that health care providers planning to provide patient or client information to an immunization system must disclose to the patient or client, or the parent or guardian of the patient or client, that their information is being shared with CAIR and advised of their rights under the law. This code was specifically established to govern who can access immunization registries, what information can be maintained, and how this information can be used. CAIR conforms to all requirements of this code. The CAIR2 disclosure form (<http://cairweb.org/cair-forms/>) lists the rights of the patient or parent/guardian.

Only participating health care providers have direct access to patient and immunization data in CAIR2. Patients or their guardians have the option of setting patient data as shared or not shared. When a patient record is shared, any authorized provider using CAIR2 can view the patient’s immunization data. When a patient record is set as not shared, only the patient’s primary provider can view the patient’s immunization data.

Patient disclosure information must be submitted by providers participating in data exchange with CAIR2. Before patient data can be exchanged with CAIR2, patients or clients, or the parent or guardian of the patient or client must be given the opportunity to “opt-out” of having their data shared in CAIR2. This data should still be sent to CAIR2 as a “locked” (not shared) record.

The local health department and the State Department of Health Services may maintain access to these “locked” records for the purpose of protecting the public health pursuant to Sections 100325, 120140 and 120175, as well as Sections 2500 to 2643.20, inclusive of Title 17 of the California Code of Regulations.

It is the provider’s responsibility to inform patients that their immunization information is being shared with CAIR2. This can be done verbally, but it is also recommended that a sign, a printed form, or both, also be used to ensure that patients understand this disclosure.

If the provider's EMR system does not support storing disclosure and sharing information and the provider is following the guidelines set forth above for patient disclosure, it is possible to set PD1-12 to the default value of "N" (OK to share) in all submitted files. If a default value is sent in PD1-12, then the date of disclosure must be populated in PD1-13. In order to handle instances where a patient wishes to opt out of sharing, the provider would give them the CAIR2 "Decline or Start Sharing/Information Request" form for them to fax to the CAIR Helpdesk to reset their data to "not-shared" status. That form can be downloaded at www.cairweb.org/forms.

PD1-13: Protection Indicator Effective Date

This field indicates the effective date for PD1-12

Format: YYYYMMDD

PD1-16: Immunization Registry Status

This field identifies the current status of the patient in relation to the sending provider organization. If PID-29 (date of death) is populated, then the value of PD1-16 must be 'P' – Permanently Inactive. Refer to User Defined Table 0441 in the CDC Implementation Guide for all accepted values.

PD1-17: Immunization Registry Status Effective Date

This field indicates the effective date for the registry status reported in PD1-16.

NK1: Next of Kin Segment

The NK1 segment contains information about the patient's other related parties. The segment is optional, but if submitted in the HL7 message, the following field requirements must be followed. **If any of the required fields are left empty, the NK1 segment will be ignored and a 'warning' will be issued in the ACK.**

Position	Field Name	Status
1	Set id - NK1	required
2	Name	required
3	Relationship	required
4	Address	required, but may be empty
5	Phone number	required, but may be empty

NK1-1: Set ID

This field contains the number that identifies this transaction. For the first occurrence of the segment, the sequence number shall be '1' (one), for the second occurrence the sequence number shall be '2' (two), and so on...

NOTE: This field is required if the data in the NK1 segment data is to populate CAIR.

NK1-2: Name

This field contains the name of the next of kin or associated party. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	family name	required
2	given name	required
3	middle initial or name	required, but may be empty
4	suffix	optional
5	prefix	ignored
6	degree	ignored
7	name type code	ignored
8	name representation code	ignored

NK1-3: Relationship

This field contains the actual personal relationship that the next of kin/associated party has to the patient. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty. use HL70063
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

Note: For the identifier, please refer to User-defined table 0063 – Relationship.

NK1-4: Address

This field contains the address of the next of kin or associated party. The field follows the same address formatting rule as the PID-11 field.

NK1-5: Phone Number

This field contains the phone number of the next of kin or associated party. The field follows the same phone number formatting rule as the PID-13 field.

ORC: Order Control Segment

The Order Request (ORC) segment is required for 2.5.1 messages and indicates information about the pharmaceutical order. While many of the elements don't apply directly to immunizations (as the immunizations are usually ordered, delivered, and administered at the same location), some of the fields allow for better control of immunization data.

Position	Field Name	Status
1	Order Control	required, constrain to 'RE'
2	Placer Order Number	required, but may be empty
3	Filler Order Number	required, but may be empty
4	Placer Group Number	ignored
5	Order Status	ignored
6	Response Flag	ignored
7	Quantity/Timing	ignored
8	Parent	ignored
9	Date/Time of Transaction	ignored
10	Entered By	required, but may be empty
11	Verified By	ignored
12	Ordering Provider	required, but may be empty
13	Enterer's Location	ignored
14	Call Back Phone Number	ignored
15	Order Effective Date/Time	ignored
16	Order Control Code Reason	ignored
17	Entering Organization	required, but may be empty If populated, use the CAIR org code of the facility.
18...31		Fields 18 – 31 are ignored

ORC-1: Order Control

ORC-1 must be constrained to "RE"

ORC-2: Placer Order Number

The placer order number is used to uniquely identify this order among all orders sent by a provider organization.

ORC-3: Filler Order Number

Unique identifier from the system where the order was filled.

ORC-10: Entered By

This identifies the individual that entered this particular order.

ORC-12: Ordering Provider

This field contains the identity of the person who is responsible for creating the request (i.e., ordering physician). In the case where this segment is associated with a historic immunization record and the ordering provider is not known, then this field should not be populated.

NOTE: Immunization providers that are participating in the Department of Health Care Services, [Value Based Payment Program](#) (VBP) must have the ORC-12 field submitted to CAIR2 and populated as shown in the example below, in order to be properly counted for the VBP immunization measure. This field must contain the ordering provider's NPI number in ORC-12.1 and the Identifier Type Code "NPI" in ORC-12.13. An example of the ORC-12 field formatting is as follows:

|1234567890^WELBY^MARCUS^J^^^^^CMS_NPPES^^^^NPI^^^^^^^MD|

Position	Field Name	Status
1	ID number	Required for providers participating in the VBP program. Must be an NPI number.
2	family name	required
3	given name	required
4	middle initial or name	optional
5	suffix	optional
6	prefix	optional
7	degree	No longer used. Use professional suffix in sequence 21 (RXA-10.21)
8	source table	ignored
9	assigning authority	required if RXA-10.1 is populated
10	name type code	required, but may be empty
11	identifier check digit	ignored
12	code identifying the check digit scheme employed	ignored
13	identifier type code	Required if RXA-10.1 is populated. Must be valued with "NPI" if participating in the VBP program.
14.. 20		Components 14 – 20 are ignored
21	Professional Suffix	Required if participating in the VBP program.

ORC-17: Entering Organization

This field identifies the organization that the enterer belonged to at the time he/she enters/maintains the order, such as medical group or department. The person who entered the request is defined in ORC-10 (entered by). This will be the CAIR2 Org Code of the Site location.

RXA: Pharmacy/Treatment Administration Segment

The RXA segment carries pharmacy administration data. This segment is required to indicate which vaccinations are given. This segment is required if there are vaccinations to report. All vaccinations should be reported in one message, not in separate messages.

NOTE: INVENTORY DECREMENTING IN CAIR2 THROUGH DATA EXCHANGE:

Provider sites will now have the ability to have vaccine doses decrement from inventory in CAIR2 through data exchange. The RXA segment fields that must be included for inventory decrementing are indicated in the detailed field explanations following this table. **By default, the inventory decrementing feature for all CAIR2 sites is set to 'NO'. Sites wishing to use the inventory decrementing feature in CAIR2 must contact and coordinate with a [Data Exchange Specialist](#) at CAIR before the decrementing feature is activated.**

Position	Field Name	Status
1	Give sub-ID counter	required; constrain to "0" (zero)
2	Administration sub-ID counter	required; constrain to "1"
3	Date/time start of administration	required
4	Date/time end of administration	ignored
5	Administered code	CVX or NDC codes required. Do not send both codes in RXA-5 together.
6	Administered amount	required (if amount is unknown, use '999')
7	Administered units	required if amount is not '999'
8	Administered dosage form	ignored
9	Administration notes	required
10	Administering provider	required, but may be empty
11	Administered-at location	required if RXA-9 = '00'
12	Administered per (time unit)	ignored
13	Administered strength	ignored
14	Administered strength units	ignored
15	Substance lot number	required if administered dose
16	Substance expiration date	required, but may be empty
17	Substance manufacturer name	required if administered dose
18	Substance refusal reason	ignored
19	Indication	ignored
20	Completion status	required, but may be empty; empty field will default to 'CP'
21	Action code	required, but may be empty; empty field will default to 'A'
22..26		Fields 22 -26 are ignored.

RXA-1: Give sub ID counter

CAIR expects a "0" (zero) in this field.

RXA-2: Administration sub-ID counter

CAIR expects a "1" (one) in this field.

RXA-3: Date/time start of administration

The date/time start of administration is used to record the date of when the vaccination was given. Any time information is ignored, and need not be sent. It is important that this date be the actual date the vaccination was given and not the date that it was recorded or billed.

Format: YYYYMMDD

RXA-5: Administered code

This field identifies the medical substance administered. **CVX or NDC codes are required.** Sending an alternate code (NDC or CVX) in the second triplet of RXA-5 will result in an RXA segment failure at this time. This functionality will be available in a future release of CAIR2.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	Required (CVX or NDC).
4	alternate identifier	Will be accepted in a future CAIR release.
5	alternate text	Will be accepted in a future CAIR release.
6	name of alternate coding system	Will be accepted in a future CAIR release.

NOTE: The format of the NDC code must be 11-digit with dashes. (i.e. 12345-6789-01) Unit of Use or Unit of Sale NDC codes are accepted.

CVX and NDC crosswalk tables are available and maintained by the Centers for Disease Control and Prevention, Immunization Information System Support Branch (IISSB) for use in HL7 data transmission. The code sets are available through their website: <http://www.cdc.gov/vaccines/programs/iis/code-sets.html>. New codes are added several times a year. CDC offers an email service that sends updates when new codes are added to their tables. Information about this service is available on the websites listed above. It is critical to keep code sets up-to-date in order to appropriately report vaccinations. Steps should be taken to ensure that someone is receiving these emails and keeping the code sets up-to-date.

RXA-6: Administered amount

The amount of vaccine that was given. This should be expressed in milliliters (mL). The amount should be placed here and the units in RXA-7. **Do not put the units in this field.**

Format: Number

NOTE: If amount is unknown, use '999' in this field.

RXA-7: Administered units

The units associated with the number in RXA-6. A value of mL is expected. Example: mL^mL^UCUM

Position	Field	Status
1	identifier	required, but may be empty; should be 'mL'
2	text	ignored
3	name of coding system	required, but may be empty; use "UCUM" if valued
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

RXA-9: Administration notes

This field is used to indicate whether this immunization record is based on a historical record or was given by the reporting provider. It should contain the information source (see NIP-defined table NIP001 – Immunization information source). Health plan submitters must use the NIP001 '01' code ('source unspecified) to ensure administered data is not overwritten during the record merge process.

NOTE: This field is required and must be '00' (given vaccine) for inventory decrementing.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty; use NIP001 if valued
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

RXA-10: Administering provider

This field is intended to contain the name and provider ID of the person physically administering the vaccine. This field is required, but may be empty. If the field is valued, it must follow the specifications below. For the Administering Provider information to post successfully in CAIR2, the format of the field must be either:

|IDNumber^LastName^FirstName^^^^^^AssignAuthority^^^^TypeCode^^^^^^^^(ProfSuff-Optional)|

Or

|^LastName^FirstName^^(ProfessionalSuffix -optional)|

Position	Field Name	Status
1	ID number	required, but may be empty
2	family name	required
3	given name	required
4	middle initial or name	optional
5	suffix	optional

6	prefix	optional
7	degree	No longer used. Use professional suffix in sequence 21 (RXA-10.21)
8	source table	ignored
9	assigning authority	required if RXA-10.1 is populated
10	name type code	required, but may be empty
11	identifier check digit	ignored
12	code identifying the check digit scheme employed	ignored
13	identifier type code	required if RXA-10.1 is populated
14.. 20		Components 14 – 20 are ignored
21	Professional Suffix	required, but may be empty

NOTE: Health care providers who administer vaccines covered by the National Childhood Vaccine Injury Act are required to ensure that the permanent medical record of recipient indicates the name and title of the person who administered the vaccine. (<https://www.cdc.gov/vaccines/hcp/admin/document-vaccines.html>)

RXA-11: Administered at location

The administered at location is used to indicate the facility at which the immunization was given. The facility (**CAIR2 org code**) should be sent in position 4.

NOTE: This field is required for decrementing inventory in CAIR2 through data exchange

Position	Field Name	Status
1	point of care	ignored
2	room	ignored
3	bed	ignored
4	facility	required if RXA-9.1 value is '00'
5....16		ignored

RXA-15: Substance lot number

This field contains the log number of the vaccine administered. It may remain empty if the dose is from a historical record.

Format: String

NOTE: This field is required for decrementing inventory in CAIR2 through data exchange.

RXA-16: Substance expiration date

This field contains the expiration date of the vaccine administered. Note that vaccine expiration date does not always have a “day” component; therefore use the last day of the month for the ‘day’ component of the expiration date..

Format: YYYYMMDD

RXA-17: Substance manufacturer

This field contains the manufacturer of the vaccine administered. If the field is valued, the requirements below must be followed. Code system “**MVX**” should be used to code this field.

The CDC's National Center for Immunization and Respiratory Diseases ([NCIRD](http://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=mvx)) developed and maintains HL7 Table 0227, Manufacturers of Vaccines (MVX). The table can be found here: <http://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=mvx>

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty; use “MVX”
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

RXA-20: Completion Status

This field indicates if the dose was successfully given. Only complete records (CP) and Partial administrations (PA) are processed. Any other value sent in RXA-20 will cause the RXA segment to fail. **NOTE: An empty field will be treated as ‘CP’.**

Position	Field	Status
1	id	required, but may be empty.

HL7 User-defined Table 0322 – Completion status

Value	Description	Status
CP	Complete	accepted
RE	Refused	not accepted
NA	Not Administered	not accepted
PA	Partially Administered	accepted as a ‘subpotent dose’

RXA-21: Action code

This field indicates the action expected by the sending system. **An empty field will be treated as ‘A’.**

Value	Description	Status
A	Add	accepted
U	Update	accepted
D	Delete	accepted

RXR: Pharmacy Route Segment

The Pharmacy Route (RXR) segment is a continuation of RXA segment.

Position	Field	Status
1	route	required, but may be empty
2	site	required, but may be empty
3...5	administration device	Fields 3 – 5 are ignored

RXR-1: Route

The route is the place or method that was used to give the vaccination. This is normally dependent on the type of vaccination given. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty
4...6		ignored

NOTE: Codes for the identifier can be found in HL7-defined Table 0162 – Route of administration. FDA NCI Thesaurus codes are now accepted in RXR-1.1.

RXR-2: Site

The site is the place on the body that the vaccination was given. This is normally decided at time of administration. If the field is valued, the requirements below must be followed.

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	required, but may be empty; use HL70163
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

NOTE: Codes for the identifier can be found in HL7-defined Table 0163 – Administrative site.

OBX: Observation Segment

The Observation segment includes additional information that could not be sent in the RXA. In CAIR2 the OBX segment will be used to record Vaccine Eligibility by vaccine dose. Unrecognized observations will be ignored by CAIR. **If the OBX segment is sent, the below requirements must be followed.**

Position	Field Name	Status
1	Set ID - OBX	required
2	Value Type	required; constrain to "CE"
3	Observation Identifier	required if RXA-9 value is "00"
4	Observation Sub-ID	required, but may be empty
5	Observation Value	required for decrementing inventory in CAIR2
6	Units	ignored
7	Reference Ranges	ignored
8	Abnormal Flags	ignored
9	Probability	ignored
10	Nature of Abnormal Test	ignored
11	Observation Result Status	required; should be "F" for Final
12	Effective Date of Reference Range Values	ignored
13	User Defined Access Checks	ignored
14	Date/Time of the Observation	required, but may be empty
15...25		ignored

OBX-1: Set ID – OBX

Indicates the current sequence number for this OBX as it sits under the RXA.

OBX-2: Value Type

This field contains the format of the observation value in OBX. **Value type will be 'CE'**

OBX-3: Observation Identifier

This indicates what kind of data is being sent in this OBX. One way to look at this is OBX-3 poses the question and OBX-5 answers it. For example, OBX-3 will indicate Vaccine funding program eligibility, which can be read as "What program was this person eligible for when this vaccine was administered?" The answer in OBX-5 could be "VFC eligible-Medi-Cal/Medi-Cal Managed Care."

Position	Field	Status
1	identifier	required, shall be 64994-7
2	text	optional
3	name of coding system	required, use 'LN'
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

Table LN – LOINC

Value	Description	Status
64994-7	Vaccine funding program eligibility category	accepted

OBX-4: Observation Sub-ID

Indicates if this observation is part of a grouping.

OBX-5: Observation Value (VFC eligibility)

This is the answer to the question that was posed in OBX-3. This is where the VFC eligibility is recorded at the vaccine level. **An empty value will be treated as “Unknown”.**

For proper inventory decrementing in CAIR2, the Vaccine Eligibility Funding Status in OBX-5 is required and must match the funding source of the vaccine lot in CAIR2.

Position	Field	Status
1	identifier	required, but may be empty
2	text	optional
3	name of coding system	required, but may be empty, use HL70064

CAIR Accepted Values for VFC Eligibility Funding Status in OBX-5.

Value	Description
V01	not VFC eligible (Private Pay/Insurance)
V02	VFC eligible – Medi-Cal/Medi-Cal Managed Care
V03	VFC eligible - Uninsured
V04	VFC eligible - American Indian/Alaskan Native
V05	VFC eligible - Underinsured
V07	Public vaccine - State-specific eligibility [317 Special Funds]
CAA01	State General Fund Vaccines

For more information on 317 Funded Vaccines and State General Fund Vaccines:

<http://eziz.org/assets/docs/IMM-1142.pdf>

Here is an example of how to report VFC eligibility in the OBX segment:

```
OBX|1|CE|64994-7^Vaccine funding program eligibility category^LN||V02^VFC eligible-Medi-Cal/Medi-Cal Managed Care^HL70064|||||F|||20110701130100
```

OBX-14: Date/Time of the Observation

Records the date/time of the observation

HL7 ACK FILE FORMAT AND CONTENT

CAIR2 ACK messages are formatted following the CDC HL7 guidelines for immunization messaging.

There are two fields stored in the MSH segment that pertain to acknowledgements: MSH-15 and MSH-16. The MSH-16 field, Application Acknowledgement Type, is used to determine the conditions for sending an acknowledgement message indicating the success or failure to process the data contained in the VXU message. The following table shows results for the five potential values:

Value	Description	Status
AL	Always	ACK message always sent
NE	Never	ACK message never sent
ER	Error	ACK message sent only on error condition
SU	Success	ACK message sent only on successful load
<blank>	Blank value	If blank MSH-16 treated as 'ER'

CAIR2 ACK Segment Structure

Segment	Cardinality	Usage	Comment
MSH	(1..1)	R	Message Header Segment. Every message begins with an MSH.
MSA	(1..1)	R	Message Acknowledgment. Every ACK has at least one MSA segment.
[{ERR}]	(0..*)	RE	Error description. Included if there are errors

MSH – Message Header Segment

The Message Header Segment for the ACK will have the same number of fields as the VXU MSH segment. The values in the fields will reflect information about a previously received, single record. The data types for each component and sub-component are the same for the VXU MSH and the ACK MSH

MSA – Message Acknowledgment Segment

The MSA segment contains information used to identify the receiver's acknowledgement response to an identified prior message.

Position	Field Name	Status
1	Acknowledgment Code	Required
2	Message Control ID	Required

MSA-1 – Acknowledgment code

This field contains an acknowledgment code from table HL70008.

In MSA-1 only the value shown in the table will be used.

Value (MSA-1)	Description	Comment
AA	Application Accept	Message was accepted without error
AE	Application Error	Message was processed and errors are being reported.
AR	Application Reject	Message was rejected because one of the following occurred: <ul style="list-style-type: none">• Unsupported Message Type• Unsupported event code• Unsupported processing ID• Unable to process for reasons unrelated for format or content

MSA-2 – Message Control ID

This field contains the message control ID of the message sent by the sending system. It allows the sending system to associate this response with the message for which it is intended. **This field echoes the message control id sent in MSH-10 by the initiating system.**

ERR – Error Segment

The error segment reports information about errors or warnings in processing the message. The segment may repeat. Each error or warning will have its' own ERR segment.

Position	Field Name	Status
1	Error code and location	Not supported in v2.5.1
2	Error location	Required
3	HL7 error code	Required (refer to HL7 table 0357)
4	Severity	Required; if error occurs, will use “E”, if warning occurs will use ‘W’
5	Application Error Code	Required, but may be empty (refer to User Defined table 0533)
6	Application Error Parameter	Optional
7	Diagnostic Information	Optional
8	User Message	Required, but may be empty

EXAMPLE ACK MESSAGES GENERATED BY CAIR2:

WARNING (Informational)

```
MSH|^~\&|CAIR IIS4.0.0|CAIR
IIS||UATPARENT|20160630||ACK^V04^ACK|TEST001|P|2.5.1|||||||CAIR IIS|UATPARENT
MSA|AE|1791129
ERR||RXA^1^10^1^13|0^Message accepted^HL70357|W|5^Table value not
found^HL70533|||Informational error - No value was entered for RXA-10.13
```

ERROR (Message Rejected)

```
MSH|^~\&|CAIR IIS4.0.0|CAIR
IIS||UATPARENT|20160630||ACK^V04^ACK|TEST001|P|2.5.1|||||||CAIR IIS
MSA|AE|1791129
ERR||PID^1^3^0|101^Required field missing^HL70357|E|6^Required observation
missing^HL70533|||MESSAGE REJECTED - REQUIRED FIELD PID-3-5 MISSING
```

APPLICATION REJECTION

```
MSH|^~\&|CAIR IIS4.0.0|CAIR
IIS||UATPARENT|20160630||ACK^V04^ACK|TEST001|P|2.5.1|||||||CAIR IIS|UATPARENT
MSA|AR|1791129
ERR||MSH^1^11|202^Unsupported processing ID^HL70357|E|4^Invalid value^HL70533|||MESSAGE
REJECTED. INVALID PROCESSING ID. MUST BE 'P'
```

VALID MESSAGE – No Errors or Warnings

```
MSH|^~\&|CAIR IIS4.0.0|CAIR
IIS||UATPARENT|20160630||ACK^V04^ACK|TEST001|P|2.5.1|||||||CAIR IIS|UATPARENT
MSA|AA|1791129
```

APPENDIX A

CAIR Receiving Facility (Region) Codes for MSH-6 (Ignored field except for CAIRSJ and CAIRSD)

County	CAIR Regional Registry	CAIR Region Code (MSH-6)
ALAMEDA	BAY AREA	CAIRBA
ALPINE	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
AMADOR	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
BUTTE	NORCAL	CAIRNC
CALAVERAS	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
COLUSA	NORCAL	CAIRNC
CONTRA COSTA	BAY AREA	CAIRBA
DEL NORTE	NORCAL	CAIRNC
EL DORADO	GREATER SACRAMENTO	CAIRGS
FRESNO	CENTRAL VALLEY	CAIRCV
GLENN	NORCAL	CAIRNC
HUMBOLDT	NORCAL	CAIRNC
IMPERIAL	IMPERIAL (MERGED)	CAIRIC
INYO	CENTRAL VALLEY	CAIRCV
KERN	CENTRAL VALLEY	CAIRCV
KINGS	CENTRAL VALLEY	CAIRCV
LAKE	NORCAL	CAIRNC
LASSEN	NORCAL	CAIRNC
LOS ANGELES	LA-ORANGE	CAIRLO
MADERA	CENTRAL VALLEY	CAIRCV
MARIN	BAY AREA	CAIRBA
MARIPOSA	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
MENDOCINO	NORCAL	CAIRNC
MERCED	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
MODOC	NORCAL	CAIRNC

MONO	CENTRAL VALLEY	CAIRCV
MONTEREY	BAY AREA	CAIRBA
NAPA	BAY AREA	CAIRBA
NEVADA	GREATER SACRAMENTO	CAIRGS
ORANGE	LA-ORANGE	CAIRLO
PLACER	GREATER SACRAMENTO	CAIRGS
PLUMAS	NORCAL	CAIRNC
RIVERSIDE	INLAND EMPIRE	CAIRIE
SACRAMENTO	GREATER SACRAMENTO	CAIRGS
SAN BENITO	BAY AREA	CAIRBA
SAN BERNARDINO	INLAND EMPIRE	CAIRIE
SAN DIEGO	SAN DIEGO (INDEPENDENT)	CAIRSD
SAN FRANCISCO	BAY AREA	CAIRBA
SAN JOAQUIN	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
SAN LUIS OBISPO	CENTRAL COAST	CAIRCC
SAN MATEO	BAY AREA	CAIRBA
SANTA BARBARA	CENTRAL COAST	CAIRCC
SANTA CLARA	BAY AREA	CAIRBA
SANTA CRUZ	BAY AREA	CAIRBA
SHASTA	NORCAL	CAIRNC
SIERRA	NORCAL	CAIRNC
SISKIYOU	NORCAL	CAIRNC
SOLANO	BAY AREA	CAIRBA
SONOMA	BAY AREA	CAIRBA
STANISLAUS	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
SUTTER	GREATER SACRAMENTO	CAIRGS
TEHAMA	NORCAL	CAIRNC
TRINITY	NORCAL	CAIRNC
TULARE	CENTRAL VALLEY	CAIRCV

TUOLUMNE	SAN JOAQUIN (INDEPENDENT)	CAIRSJ
VENTURA	CENTRAL COAST	CAIRCC
YOLO	GREATER SACRAMENTO	CAIRGS
YUBA	GREATER SACRAMENTO	CAIRGS

