



CAIR2 HL7 v2.5.1 VXU Implementation Guide

California Immunization Registry

Version 3.05

Consistent with

[HL7 Version 2.5.1 Implementation Guide
for Immunization Messaging, Release 1.5](#)

September 17, 2018

REVISION HISTORY

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S. Nickell	September 17, 2018	3.05	<ul style="list-style-type: none"> • Added independent registry region codes in anticipation of data sharing

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-tech-support/>

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HOW TO USE THIS DOCUMENT

This document contains the updated specifications for sending HL7 data to CAIR2 consistent with the [HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5](#).

On Friday September 30, 2016, the current data exchange submission process used by submitters in the 'CAIR 7' regional registries ([NorCal](#), [Gr. Sacramento](#), [Bay Area](#), [Central Valley](#), [Central Coast](#), [Inland Empire](#), and [LA-Orange](#)) will end. **On Monday October 3rd 2016, all data exchange submitters in the 'CAIR 7' will begin submitting data to the new CAIR2 database.**

A few simple changes to your Site's current data submission process will be required and these are described in the first section of this document entitled '**MOVING FROM CAIR1 TO CAIR2 – IMPORTANT CHANGES**'. Please make sure your Site's EHR vendor and Sending Facility (if you use one) are aware of these changes so they can be implemented in time for the switchover to CAIR2 submission on October 3rd 2016.

New Sites who intend to submit data to CAIR2 should review this entire document.

Note: In order to accommodate the training of 1000s of CAIR web interface users across the state, transition to use of the CAIR2 software will occur in three phases over a number of months with 1 or more regions transitioning to use of CAIR2 in each phase (see [CAIR2 Transition Timeline](#)). Since all data exchange Sites will begin sending data to CAIR2 on October 3rd 2016, the submitted CAIR2 data for Sites in the three regions whose users do not transition to CAIR2 on that date will be synchronized back to the CAIR1 databases and be accessible via the CAIR1 software (although delayed by several days) until those Sites and users transition to the CAIR2 software in Phase 2 (Bay Area, Central Valley) and Phase 3 (LA-Orange). If you have questions, please email CAIRDataExchange@cdph.ca.gov

MOVING FROM CAIR1 TO CAIR2 – IMPORTANT CHANGES

All current data exchange (DX) submitters in the 'CAIR 7' regions **will begin submitting data to CAIR2 on October 3rd 2016**. This section summarizes the changes to your HL7 messages and SOAP transport process that will need to be implemented beginning on October 3rd 2016 for your data to be accepted by CAIR2.

A. HL7 MESSAGE SPECIFICATION CHANGES FOR CAIR2

HL7 VXU message changes are summarized below, with critical changes that affect whether a message is accepted highlighted in light blue.

Segment / Field	Data Element	CAIR1 Usage	CAIR2 Usage	Comment	If Error, Type Returned
MSH-11	Processing ID	R	R	Value must be 'P'.	Error / Message Rejection
MSH-22	Sending Responsible Organization	O	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.	Error / Message Rejection
PID-3.5	Patient Identifier Type Code	RE	R	PID-3.5 must be present and contain one of these values: MR, PI, PN, PRN, or PT . (example PID-3 format: 12345^^^EDM^MR) Empty PID-3.5 fields will cause message rejection.	Error / Message Rejection
PID-25	Birth Order	O	C(R/O)	If PID-24 is valued with a 'Y', indicating patient was part of a multiple birth in CAIR2, PID-25 must contain the birth order number (1, 2, etc.)	Warning
PD1-3	Patient Primary Facility	RE	O	This field is now ignored	None
PV1	Patient Visit Segment	RE	X	The PV1 segment is now ignored	None
NK1-1	Set ID	O	R	If Set ID not sent or is an invalid value, the NK1 segment will not process.	Warning is sent and NK1 segment not inserted if NK1-1 is empty.
RXA-5	Administered Code	R	R	In addition to CVX codes, NDC codes will be accepted in a future release of CAIR2.	Error / RXA segment not inserted
RXR-1	Route of Administration	RE	RE	FDA NCI Thesaurus (NCIT) values now accepted in this field. (Route codes from HL7-defined Table 0162 are still accepted).	Warning sent if invalid codes are submitted.

B. SOAP WSDL CHANGES

The new CAIR2 database is in a different location so 'production' data submitters will need to download and install the CAIR2 WSDL. Please contact the CAIR DX Team for the CAIR2 WSDL URL address so that beginning October 3rd 2016, HL7 messages are sent to the CAIR2 database.

C. PRE-TRANSITION TESTING

Because the CAIR2 specs have changed, CAIR has an open a 'testing' environment for pre-transition testing on or about September 10th 2016. If a submitter wishes to send CAIR2 'test' messages to the 'testing' environment prior to switchover, a separate [CAIR2 TEST WSDL](#) (URL: <https://cair.cdph.ca.gov/CATRN-WS/ISService?WSDL>) will be required. Please review returned HL7 ACK messages (see below) for 'test' message status. 'Test' messages will also be monitored by DX staff so contact the DX staff at CAIRDataExchange@cdph.ca.gov if you have questions.

D. HL7 ACK MESSAGE PROCESS CHANGES

During the testing and production phases of CAIR1, diagnostic email notifications were returned as part of the HL7 message validation process. However, with CAIR2, these email validations will be replaced by standard HL7 ACK messages sent back to the submitter. These ACKs follow the format laid out in the [HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5](#) and will provide details as to any segments/fields that contain errors. The ACK will also inform as to whether the error constituted a message failure or simply an informational error/warning. See page 38 of this guide for details on the ACK format. If your Site is submitting data to CAIR2 through an intermediary Sending Facility (e.g. HIE, cloud-based EHR, data warehouse, etc.), contact your Sending Facility and EHR vendor to confirm that your ACKs will be returned by the Sending Facility and can be displayed in your EHR system so your Site can track data exchange transactions for the purpose of quality assurance.

If your EHR system cannot receive and display returned ACK messages, your Site will be able to monitor data exchange messaging via the 'Check Status' functionality that will be available to CAIR2 'Power' users at launch and also available via a new 'Data Exchange Quality Assurance' ('DX QA') user role to be added later. If your Site does not currently have a 'Power' user and you wish to monitor data exchange activity, go to the [CAIR Account Update](#) site and add a 'Power' user. Trainings of new CAIR2 regional users, however, will not begin until the CAIR2 software has launched in each region (see [CAIR Timeline](#))

For DX sites that cannot display ACK messages in their EHR systems and are in regions whose users will transition to the new CAIR2 software later than October 3rd 2016 (e.g. Bay Area, Central Valley, and LA-Orange), please contact CAIR DX staff (CAIRDataExchange@cdph.ca.gov) with your CAIR ID so that CAIR DX staff can monitor your Site's incoming DX transactions and alert you if any significant submission issues

arise during the period before CAIR2 launches in your region and your 'Power' users can begin accessing the 'Check Status' DX monitoring functionality.

E. 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:

1. Inventory with matching lot number and funding source need to exist in CAIR2,
2. 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.

F. DX SITE USER TRAINING

Despite the fact that DX Sites will begin data submission to CAIR2 on October 3rd 2016, because of the phased implementation of the CAIR2 software (See [CAIR2 Timeline](#)), web interface users (e.g. 'Power', 'Regular', or 'Read-Only') at DX Sites in the CAIR Bay Area, Central Valley and LA-Orange regions will not be able to access their submitted data in CAIR2 until their regions transition. In the meantime, users in those regions will have access to all regional DX data submitted to CAIR2 via a process of data synchronization back to their respective CAIR1 regional database. Submitted CAIR2 DX data is expected to be available in the CAIR1 regional database within a week of submission. As is the case for all CAIR Sites, 'Power' and 'Regular' users at CAIR DX Sites should review the CAIR2 Timeline (link above) and make sure to register for and attend a mandatory training so they can access CAIR2 when their region transitions. 'Read-Only' users will not need to attend formal training but will be referred to training videos.

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](http://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf) (URL: <http://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.

HEALTH PLAN DATA

CAIR2 will begin accepting ‘secondary source’ HL7 data derived from patient billing, claims, or encounters and supplied by health plans (HPs) or independent practice associations (IPAs) in the Spring of 2017. Acceptance of such data is intended to supplement doses already received from medical care providers at the ‘point of service’. For simplicity, we will refer to this type of data as ‘HP’ data. Because data coming into CAIR2 requires patient disclosure, CAIR2 will assume that any patient whose billing/claims/encounter data is submitted to CAIR2 has been properly disclosed. See CAIR disclosure docs [here](#). ‘HP’ data submission will involve either HL7 or flat file data submission by a special ‘HP’ user role through the CAIR2 user interface. Submitted ‘HP’ HL7 files will be required to leave the RXA-9 field blank to ensure the ‘HP’ data does not overwrite existing provider-sourced data. ‘HP’ submitters will also be required to go through a testing/validation phase plus data quality checks before being authorized to upload patient data to CAIR2. So as not to diminish overall data quality in CAIR2, only HPs with a significant percentage of HP contracted providers already participating in CAIR2 will be able to access the HP user role.

BI-DIRECTIONAL CAPABILITY – QBP/RSP

CAIR2 will support real-time immunization record query messages (QBP) and will return immunization histories or immunization histories plus forecasting in a response file (RSP). This bidirectional messaging functionality (BiDX) will be made available to CAIR2 DX sites beginning in April 2017. Specifications on query/response messaging with CAIR2 will be identical those found in the [HL7 Version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5](http://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf) (URL: <http://www.cdc.gov/vaccines/programs/iis/technical-guidance/downloads/hl7guide-1-5-2014-11.pdf>)

Sites interested in BiDX will be required to complete an online *CAIR2 Bidirectional Interest/Readiness* survey beginning in November 2016 as a first step in the BiDX onboarding process. The BiDX 'onboarding' process will begin in Summer 2017 in the CAIR2 Test environment using the **CAIR TEST WSDL** (URL: <https://cair.cdph.ca.gov/CATR-WS/IISService?WSDL>) and will involve Sites submitting a series of patient 'test' queries to CAIR2 and confirming using a patient key that the information returned by CAIR2 to their EHR systems is accurately displayed. Once the testing process is completed satisfactorily, CAIR DX staff will authorize the Site to begin real patient queries in 'production'.

An additional element to the BiDX onboarding process will be efforts to encourage Sites to consider uploading active patient historical data so that any forecast returned in an RSP message is accurate.

SENDING 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 Test Plan found on the data exchange tech support page: <http://cairweb.org/data-exchange-tech-support/>. As noted previously, CAIR2 will also begin accepting patient queries (QBP) and returning responses (RSP) in the Summer of 2017. Refer to the previous [Bidirectional Capability –QBP/RSP](#) section above for more information.

MEANINGFUL USE

Registration at the CAIR IZ Portal is considered a declaration of intent to engage in data submission to CAIR in support of 'Meaningful Use'. The Portal registration confirmation email will contain your Site's CAIR ID, SOAP password, and instructions on beginning the onboarding. For more information please visit <http://cairweb.org/data-exchange-tech-support/>.

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|^Smith^Janet^^^^^^L^^^^^^^MD |||
RXA|O|1|20140730||08^HEPB-PEDIATRIC/ADOLESCENT^CVX|.5|mL^mL^UCUM||00^NEW IMMUNIZATION
  RECORD^NIP001|1245319599^Smith^Janet^^^^^^CMS^^^^NP|^^^^^^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', '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 only. (NDC codes to be accepted in a future release of CAIR2)
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
U	Unknown	accepted

NOTE: Values are from HL7 User Defined Table 0001 - Sex

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
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

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.

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.

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
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

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
18	Entering Device	ignored
19	Action By	ignored
20	Advanced Beneficiary Notice Code	ignored
21	Ordering Facility Name	ignored
22	Ordering Facility Address	ignored
23	Ordering Facility Phone Number	ignored
24	Ordering Provider Address	ignored
25	Order Status Modifier	ignored
26	Advanced Beneficiary Notice Override Reason	ignored
27	Filler's Expected Availability Date/Time	ignored
28	Confidentiality Code	ignored
29	Order Type	ignored
30	Enterer Authorization Mode	ignored
31	Parent Universal Service Identifier	ignored

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 codes required (NDC codes to be accepted in a future release of CAIR2)
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		Components 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 codes are required. NDC codes are not currently accepted, but will be accepted in a future release of the CAIR2 software.**

Position	Field	Status
1	identifier	required
2	text	optional
3	name of coding system	Required (CVX).
4	alternate identifier	not currently accepted
5	alternate text	not currently accepted
6	name of alternate coding system	not currently accepted

CVX and NDC crosswalk tables are available and maintained by the Centers for Disease Control and Prevention, Immunization Information System Support Branch (IISB) 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: This field is required. 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; Health Plans must use NIP001 code '01'
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.

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	optional

RXA-11: Administered at location

The administered at location is used to indicate the facility at which the immunization was given. The facility (**CAIR Provider Site ID**) 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	location status	ignored
6	patient location type	ignored
7	building	ignored
8	floor	ignored
9	street address	optional
10	other designation	optional
11	city	optional
12	state or province	optional
13	zip or postal code	optional
14	country	optional
15	address type	ignored
16	other geographic designation	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	administration device	ignored
4	administration method	ignored
5	routing instruction	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	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 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 CAIR the OBX segment will be used to record VFC (Vaccine for Children) 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	Producer's Reference	ignored
16	Responsible Observer	ignored
17	Observation Method	ignored
18	Equipment Instance Identifier	ignored
19	Date/Time of Analysis	ignored
20	Reserved	ignored
21	Reserved	ignored
22	Reserved	ignored
23	Performing Organization Name	ignored
24	Performing Organization Name	ignored
25	Performing Organization Name	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 status 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
4	alternate identifier	ignored
5	alternate text	ignored
6	name of alternate coding system	ignored

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>

OBX-14: Date/Time of the Observation

Records the date/time of the observation

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
```

HL7 ACK FILE FORMAT AND CONTENT

During the testing and production phases of CAIR1, diagnostic email notifications were returned as part of the HL7 message validation process. However, with CAIR2, these email validation emails will be replaced by standard HL7 ACK messages sent back to the submitter. The 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

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

APPENDIX B

BEHAVIOR DIFFERENCES BETWEEN CAIR1 AND CAIR2

The table below is informational. It displays differences between CAIR1 and CAIR2 that clinics should be aware of, but may have little to no impact on your data submissions.

CAIR 1 Behavior	CAIR 2 Behavior	Impact on Submitters
Varicella of History Accepted	Varicella of History Rejected	Low. Providers who report varicella history of disease according to the 2014 standards will have their record marked with an error.
Refusals could not be sent to CAIR.	Including a refusal on a patient record results in not being able to find the patient record when querying.	Low. When a refusal is submitted, CAIR2 will ignore the RXA segment and insert the rest of the HL7 message data into CAIR2. An ACK will be returned stating the RXA with the refusal was ignored.
If RXA-3 is missing the message is rejected	If RXA-3 is missing the message is accepted	Low. If RXA-3 is empty, the RXA segment is ignored, and the rest of the HL7 data is inserted. An ACK will be returned stating that the RXA segment was ignored.
Person Id types that IIS don't normally use are accepted.	Person Id types that IIS don't normally use are not accepted.	None to Medium. CAIR 2 only accepts 'MR', 'PI', 'PN', 'PRN', or 'PT' type codes. Empty PID-3.5 fields will result in a message rejection.
Random race taken from expanded CDC code list not accepted	Random race taken from expanded CDC code list is now accepted	None. Expanded functionality, no impact to current submitters.
Certain body route codes not accepted.	All body route codes now accepted.	None. Expanded functionality, new system is more compatible, only positive impact for current submitters.
These issues were not tolerated: <ul style="list-style-type: none"> Invalid Race Invalid Ethnicity RXA-3 Date/Time Start of Administration includes time 	These issues are now tolerated: <ul style="list-style-type: none"> Invalid Race Invalid Ethnicity RXA-3 Date/Time Start of Administration includes time 	None: This will make it easier for important data to be submitted to CAIR.
These issues were tolerated: <ul style="list-style-type: none"> PID-5.2 Patient last name is only one character Message includes observations not typically sent to IIS 	These issues are now not tolerated: <ul style="list-style-type: none"> PID-5.2 Patient last name is only one character Message includes observations not typically sent to IIS 	Low to Medium: The patient last name length issue is not an issue that will impact submitters. While it's possible for a patient last name to be only one character there is not standard that says an IIS cannot reject this. This should not have an impact on submitters.

		<p>If an observation is submitted that is not accepted by CAIR2, a warning ACK will be returned stating that the observation is not accepted and the rest of the HL7 message will be inserted into CAIR2.</p>
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