Test Plan for HL7 VXU Submission to CAIR2

California Immunization Registry
Version 3.2
October 25, 2021

Revision History

Editor	Edit Date	Version	Changes
E. Dansby	July 28, 2016	1.0	-
E. Dansby / S. Nickell	August 24, 2016	1.1	-
S. Nickell	November 15, 2016	1.2	-
E. Dansby	March 1, 2017	1.3	(Updated Table 1)
E. Dansby	October 21, 2019	2.0	Updated Table 1, links, and refined some text
I. Cheever / E. Dansby	February 25, 2020	3.0	Added test patients, updated Table 1, links, and refined text
I. Cheever / E. Dansby	August 3, 2020	3.1	Updated test patients
I. Cheever / E. Dansby	October 25, 2021	3.2	Updated staging WSDL, patient data elements required for testing, and test patients

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.

Overview

This document is intended for data exchange (DX) submitters that have registered at the CAIR Immunization Portal, have received their credentials for submitting data to CAIR2, and are ready to move forward with the testing process.

If your Site has not registered at the CAIR Immunization Portal yet, please go to the CAIR2 enrollment page to enroll.

Message Content

Prior to submitting test messages, please review the CAIR2 HL7 2.5.1 v1.5 Data Exchange Specifications document located on the CAIR2 DX Onboarding webpage for a complete and detailed overview of HL7 message requirements.

Pre-Testing Steps

CAIR2 Staging WSDL (Direct Submitters and Data Aggregators only)

To send test messages to the CAIR2 staging environment, submitters will need to download and install the CAIR2 Staging WSDL to the server/interface engine that will be submitting the HL7 messages. This ensures that HL7 messages can be sent to CAIR2.

Testing HL7 Messages in CAIR2

Real Time HL7 Message Submission

The *submitSingleMessage* operation is used to submit a HL7 message. In the *submitSingleMessage* SOAP operation, the hl7Message parameter must contain the properly formatted HL7 VXU message. HL7 messages need to be wrapped in a SOAP envelope using the credentials emailed to you after registration at the CAIR Immunization Portal. Fake patient data should be used when submitting test messages to CAIR2.

Example SOAP message:

<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope"

xmlns:urn="urn:cdc:iisb:2011">

    <soap:Header/>

    <soap:Body>

        <urn:submitSingleMessage>

        <urn:username>Portal Username</urn:username>

        <urn:password>Portal Password</urn:password>

        <urn:facilityID>Portal Facility ID</urn:facilityID>

        <urn:hl7Message>**<![CDATA[**

MSH|^~\&|MyEMR|DE-000001|…

……

]]>

</urn:hl7Message>

</urn:submitSingleMessage>

</soap:Body>

</soap:Envelope>

Note: As shown in the example SOAP message, in the SOAP UI application you will need to add '**<![CDATA[**' before 'MSH' in the HL7 message and use closing brackets '**]]>**' at the end of the HL7 message.

If the *submitSingleMessage* is unsuccessful, make sure:

- The correct SOAP Username and SOAP Password assigned through the online registration Portal are being used.
- The correct WSDL is being used

If still unsuccessful, please email CAIRdataexchange@cdph.ca.gov

HL7 ACK/NAK Process

As each submitted HL7 VXU message is received by CAIR2, an HL7 ACK (message accepted) or NAK (message has errors/warnings) is returned back to the submitter. The returned ACK/NAKs will help to guide your Site in making changes to your data formatting until you can submit a message without errors. These ACK/NAKs follow the format laid out in the CDC 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 NAK will also inform as to whether the error constituted a message failure or simply an informational error/warning. **See page 40** of the CAIR2 HL7 2.5.1 v1.5 Data Exchange Specifications on the CAIR2 DX Onboarding webpage for details on the ACK/NAK format.

If your Site is submitting data to CAIR2 through an intermediary Sending Facility (e.g. HIE, cloud-based EHR, data warehouse, etc.), you should contact the Sending Facility and your EHR vendor to determine whether ACK/NAKs returned to the Sending Facility by CAIR2 can be returned and displayed in your EHR. As noted previously, Sites must monitor returned ACK/NAK messages and make corrections to their submissions as needed. Test messaging will also will be monitored by DX staff who can be consulted at any time if a Site has questions, at CAIRDataExchange@cdph.ca.gov. Also, if your Site would like to engage in more extensive end-to-end message testing, contact CAIRDataExchange@cdph.ca.gov for a CAIR2 User Interface test account.

Data Validation

The following table and HL7 example will be primarily beneficial to non-technical staff, as the required data elements for the test patients listed below contains only a partial list of segments/fields required for a successful HL7 message. Please ensure IT/EMR staff have reviewed the CAIR2 HL7 2.5.1 v1.5 Data Exchange Specifications document on the CAIR2 DX Onboarding webpage for complete and detailed HL7 message requirements.

At minimum, all test patients must contain:

Table 1: Data Elements and Segments/Fields that shall be validated during the testing process

Patient Information	Required	HL7 Segment / Field	Usage	HL7 Code Table	Comment
Patient ID	YES	PID-3	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'
Patient Name	YES	PID-5	R		Each name field has a 50-character length limit in CAIR2
Mother's Maiden Name	YES, if available: needed for patient matching	PID-6	RE		
Date of Birth	YES	PID-7	R		YYYYMMDD
Sex	YES	PID-8	R	HL70001	'M', 'F', 'X' or 'U' only
Race	YES	PID-10	RE	HL70005	
Patient Address	YES	PID-11	RE		

Patient Information	Required	HL7 Segment / Field	Usage	HL7 Code Table	Comment
Phone	YES	PID-13	RE		Example: Home Phone |^PRN^PH^^^555^5555555| Cell Phone |^PRN^CP^^^555^5551234|
Email	YES	PID-13	RE		Example: |^NET^X.400^CAIR@CAIR.COM|
Ethnicity	YES	PID-22	RE	HL70189	Used to further identify race as Hispanic or non-Hispanic
Protection Indicator	YES	PD1-12	R		'Y', 'N'. Indicates whether patient data should be 'locked' so other CAIR providers can't view.
Next of Kin Name	YES	NK1-2	R		Name of next of kin or associated party
Relationship	YES	NK1-3	R	HL70063	Personal relationship that the next of kin or associated party has to the patient
Ordering Provider	YES, if given dose	ORC-12	RE		NPI, provider name, assigning authority, identifier type code, and professional suffix are required
Date/Start of Administration	YES	RXA-3	R		YYYYMMDD
Administration Code	YES	RXA-5	R		CVX or NDC codes accepted

Patient Information	Required	HL7 Segment / Field	Usage	HL7 Code Table	Comment
Administered Amount	YES	RXA-6	R		Required for all doses
Administered Notes	YES	RXA-9	R	NIP001	Indicates historical or given shot
Administering Provider	YES	RXA-10	C(RE/O)		The person who administered the shot. If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA'.
Administered-at Location	YES	RXA-11	C(R/O)		CAIR2 org code of the location where the shot was administered
Substance Lot Number	YES, if given dose	RXA-15	C(R/O)		If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA', substance lot number must be supplied
Substance Lot Manufacturer	YES, if given dose	RXA-17	C(R/O)	HL70227	If RXA-9.1 = '00' and RXA-20 is valued at 'CP' or 'PA' MVX code only
Route	YES, if given dose	RXR-1	RE	HL70162	Route of the administration
Administration Site	YES, if given dose	RXR-2	RE	HL70163	Body site of the administration route
Observation Identifier	YES	OBX-3	R	NIP003	Only "64994-7" Vaccine funding program eligibility category accepted All other OBX segments will be ignored
Observation Value	YES	OBX-5	R	HL70064	This is where the code for VFC eligibility will be recorded at the vaccine level

For detailed information on segments and fields, please review the CAIR2 HL7 2.5.1 v1.5 Data Exchange Specifications document on the [CAIR2 DX Onboarding Webpage](#).

Highlighted Patient Data Required for Testing

While only data elements from Table 1 have been highlighted below, all HL7 messages sent to CAIR2 should be as complete and accurate as possible. Throughout the testing process, CAIR Data Exchange Specialists will provide feedback on various segments/fields that may or may not be highlighted below.

Note that indentation has been added to each segment for readability.

MSH|^~\&|MyEMR|DE-000001||CAIR2|20200225123030||VXU^V04^VXU_V04|CA0001|P|2.5.1|||AL|AL||||||DE-000001

PID|1||PA123456^^^XYZCLINIC^MR||JONES^GEORGE^M^JR|MILLER^MARTHA^G|20140227|M||2106-3^WHITE^HL70005|1234 W FIRST ST^^BEVERLY HILLS^CA^90210^^H^^||^PRN^PH^^^555^5555555~^PRN^CP^^^555^5551234~^NET^X.400^cair@cair.com||ENG^English^HL70296||||||||2186-5^ not Hispanic or Latino ^HL70189||Y|2

PD1|||||||||||02^REMINDER/RECALL – ANY METHOD^HL70215|N|20140730|||A|20140730|

NK1|1|JONES^MARTHA|MTH^MOTHER^HL70063||||||||||||||||

ORC|RE||197023^CMC|||||||^Clark^Dave||1245319599^Smith^Janet^^^^^^CMS_NPPES^^^^NPI^^^^^^^MD|||||

RXA|0|1|20200225||08^HEPB-PEDIATRIC/ADOLESCENT^CVX|.5|mL^mL^UCUM||00^NEW IMMUNIZATION RECORD^NIP001|85041235^Bear^Elizabeth^^^^^^NG^^^^NP^^^^^^^^NP|^^^DE-000001||||0039F|20200531|MSD^MERCK^MVX|||CP|A

RXR|IM^INTRAMUSCULAR^HL70162|LA^LEFT ARM^HL70163

OBX|1|CE|64994-7^Vaccine funding program eligibility category^LN|1|V03^VFC eligibility – Uninsured^HL70064

|||||||F|||20200225140500

Test Patients

Create the following patients based on the site's clinic type. Sites are welcome and encouraged to create additional test patients or send additional CVX or NDC codes not listed below based on their testing needs. While not all test patient ages or data elements (e.g. vaccine eligibility) may be applicable to the site, testing all scenarios listed under the clinic type is important for future data completeness and accuracy.

Throughout the testing process, review the returned acknowledgments (ACKs) and make corrections as needed.

Pediatric Clinic

Create five (5) test patients.

Patient 1: age 2 months

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 1	DTaP-HepB-IPV	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 1	Hep B	Historical on DOB	-	-	-	-	N/A
PT 1	Hib	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 1	PCV13	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 1	Rotavirus	Today	-	-	-	-	Medi-cal/CHDP eligible

Patient 2: age 6 months

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 2	DTaP-IPV/Hib	Historical at 2 mo	-	-	-	-	N/A
PT 2	DTaP-IPV/Hib	Historical at 4 mo	-	-	-	-	N/A
PT 2	DTaP-IPV/Hib	Today	-	-	-	-	Private
PT 2	HepB	Historical on DOB	-	-	-	-	N/A
PT 2	HepB	Historical at 2 mo	-	-	-	-	N/A
PT 2	HepB	Today	-	-	-	-	Private
PT 2	Influenza (seasonal)	Today	-	-	-	-	Private
PT 2	PCV13	Historical at 2 mo	-	-	-	-	N/A

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 2	PCV13	Historical at 4 mo	-	-	-	-	N/A
PT 2	PCV13	Today	-	-	-	-	Private
PT 2	Rotavirus	Historical at 2 mo	-	-	-	-	N/A
PT 2	Rotavirus	Historical at 4 mo	-	-	-	-	N/A
PT 2	Rotavirus	Today	-	-	-	-	Private

Patient 3: age 4 years

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 3	DTap	Today	-	-	-	-	Uninsured
PT 3	HepA	Historical at 12 mo	-	-	-	-	N/A
PT 3	HepA	Today	-	-	-	-	Uninsured
PT 3	HepB	Historical at 12 mo	-	-	-	-	N/A
PT 3	HepB-Hib	Today	-	-	-	-	Uninsured
PT 3	Hib	Historical at 12 mo	-	-	-	-	N/A
PT 3	Influenza (seasonal)	Historical at 12 mo	-	-	-	-	N/A
PT 3	Influenza (seasonal)	Today	-	-	-	-	State General Fund
PT 3	MMRV	Today	-	-	-	-	Uninsured
PT 3	PCV13	Historical at 12 mo	-	-	-	-	N/A
PT 3	PCV13	Today	-	-	-	-	Uninsured
PT 3	Polio (IPV)	Historical at 12 mo	-	-	-	-	N/A
PT 3	Polio (IPV)	Today	-	-	-	-	Uninsured

Patient 4: age 12 years

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 4	DTaP-IPV	Historical at 4 yrs	-	-	-	-	N/A
PT 4	HepA	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	HepB	Historical on DOB	-	-	-	-	N/A
PT 4	HepB	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	HPV9	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	Influenza (seasonal)	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	MMRV	Historical at 4 yrs	-	-	-	-	N/A
PT 4	MMR	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	Polio (IPV)	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	Tdap	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	MenACWY	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	Varicella	Today	-	-	-	-	Medi-cal/CHDP eligible
PT 4	COVID (Pfizer)	Today	-	-	-	-	Medi-cal/CHDP eligible

Patient 5: age 16 years

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 5	Hep A	Historical at 12 mo	-	-	-	-	N/A
PT 5	Hep B	Historical at 12 mo	-	-	-	-	N/A
PT 5	HPV9	Today	-	-	-	-	Private
PT 5	Influenza (seasonal)	Historical at 12 mo	-	-	-	-	N/A
PT 5	MenACWY	Today	-	-	-	-	Private
PT 5	MenB	Today	-	-	-	-	Private
PT 5	MMR	Historical at 12 mo	-	-	-	-	N/A

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 5	PCV13	Historical at 12 mo	-	-	-	-	N/A
PT 5	Polio (IPV)	Historical at 12 mo	-	-	-	-	N/A
PT 5	Tdap	Today	-	-	-	-	Private
PT 5	VZV	Historical at 12 mo	-	-	-	-	N/A
PT 5	COVID (Pfizer)	Historical (9/1/21)	-	-	-	-	N/A
PT 5	COVID (Pfizer)	Historical (9/22/21)	-	-	-	-	N/A

Adult Clinic/Pharmacy

Create five (5) test patients.

Patient 1: age 21 years

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 1	Hep A	Historical at 4 yrs	-	-	-	-	N/A
PT 1	HepA-HepB	Today	-	-	-	-	Private
PT 1	Hep B	Historical at 4 yrs	-	-	-	-	N/A
PT 1	HPV9	Today	-	-	-	-	Private
PT 1	Influenza (seasonal)	Historical at 4 yrs	-	-	-	-	N/A
PT 1	MenACWY	Today	-	-	-	-	Private
PT 1	MenB	Today	-	-	-	-	Private
PT 1	MMR	Historical at 4 yrs	-	-	-	-	N/A
PT 1	MMR-VZV	Today	-	-	-	-	Private
PT 1	PCV13	Historical at 4 yrs	-	-	-	-	N/A
PT 1	Polio (IPV)	Historical at 4 yrs	-	-	-	-	N/A
PT 1	Polio (IPV)	Today	-	-	-	-	Private
PT 1	Tdap	Today	-	-	-	-	Private
PT 1	VZV	Historical at 4 yrs	-	-	-	-	N/A
PT 1	COVID (Pfizer)	Historical (3/1/21)	-	-	-	-	N/A

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 1	COVID (Pfizer)	Historical (3/22/21)	-	-	-	-	N/A

Patient 2: 30 years old

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 2	DTaP	Historical at 3 yrs	-	-	-	-	N/A
PT 2	HepA	Historical at 3 yrs	-	-	-	-	N/A
PT 2	HepA	Today	-	-	-	-	317
PT 2	HepB	Historical at 3 yrs	-	-	-	-	N/A
PT 2	HepB	Today	-	-	-	-	317
PT 2	Hib	Historical at 3 yrs	-	-	-	-	N/A
PT 2	HPV4	Historical at 20 yrs	-	-	-	-	N/A
PT 2	MCV4	Historical at 20 yrs	-	-	-	-	N/A
PT 2	MMR	Historical at 3 yrs	-	-	-	-	N/A
PT 2	MMR	Today	-	-	-	-	317
PT 2	PPSV23	Today	-	-	-	-	317
PT 2	Polio (IPV)	Historical at 3 yrs	-	-	-	-	N/A
PT 2	Varicella	Historical at 3 yrs	-	-	-	-	N/A
PT 2	Varicella	Today	-	-	-	-	317
PT 2	COVID (Moderna)	Historical (4/1/21)	-	-	-	-	N/A
PT 2	COVID (Moderna)	Historical (4/29/21)	-	-	-	-	N/A

Patient 3: 45 years old

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 3	DTP	Historical at 5 yrs	-	-	-	-	N/A
PT 3	HepA	Historical at 20 yrs	-	-	-	-	N/A
PT 3	HepA	Today	-	-	-	-	State General Fund
PT 3	HepB	Historical at 20 yrs	-	-	-	-	N/A
PT 3	Influenza (H1N1)	Historical, given in 2009	-	-	-	-	N/A
PT 3	Influenza (seasonal)	Historical at 20 yrs	-	-	-	-	N/A
PT 3	Influenza (seasonal)	Today	-	-	-	-	State General Fund
PT 3	MMR	Historical	-	-	-	-	N/A
PT 3	PCV13	Today	-	-	-	-	State General Fund
PT 3	Polio (Oral)	Historical at 5 yrs	-	-	-	-	N/A
PT 3	Td	Historical at 20 yrs	-	-	-	-	N/A
PT 3	Tdap	Today	-	-	-	-	State General Fund
PT 3	Varicella	Historical at 20 yrs	-	-	-	-	N/A
PT 3	COVID (Pfizer)	Today	-	-	-	-	State General Fund

Patient 4: 50 years old

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 4	HepA	Today	-	-	-	-	Private
PT 4	Influenza (seasonal)	Today	-	-	-	-	Private
PT 4	PCV13	Today	-	-	-	-	Private
PT 4	Tdap	Today	-	-	-	-	Private
PT 4	COVID (Moderna)	Today	-	-	-	-	Private

Patient 5: 65 years old

	Vaccine	Administered Date	Lot	MVX	Body Site	Route	Vaccine Eligibility
PT 5	HepA	Today	-	-	-	-	State General Fund
PT 5	Influenza (seasonal)	Today	-	-	-	-	State General Fund
PT 5	PCV13	Historical, age 60	-	-	-	-	N/A
PT 5	PPSV23	Today	-	-	-	-	State General Fund
PT 5	Tdap	Today	-	-	-	-	State General Fund
PT 5	Zoster	Today	-	-	-	-	317
PT 5	COVID (J&J)	Today	-	-	-	-	State General Fund

Once test messages have been validated by CAIR Data Exchange staff and found to contain zero errors, CAIR asks that the Site send production data from their EHR to CAIR2 production. CAIR will monitor production data until it is determined that the data quality is found to be satisfactory. All errors found during both the testing process and the production process should be addressed by the Site and data resubmitted. If there are any errors occurring that require further discussion, a CAIR Data Exchange Specialist (DXS) is available to assist. The CAIR DXS can be reached via email at CAIRDataExchange@cdph.ca.gov. Please include your assigned CAIR Org Code and Sending Facility ID (if you have one) in the email.

Note: Vendors, HIOs, and other data aggregators that are connecting to the Portal through a hub or cloud-based system will only need to complete the testing process once for their hub interface testing. Once the hub testing is completed, all provider sites having their data sent using this method will automatically be placed into production and monitored as outlined above.

Production Data Submission

As the site prepares to move to production data submission, all parties should know how often production data will be reviewed and who to contact for assistance in case issues arise.

Identify contacts for the following:

- Who will review acknowledgments (ACKs) sent back to the submitter and submit corrections?
- Who is the best site contact for follow up if CAIR or EMR/IT staff have questions?

Once the Site is officially in production in CAIR2, no further test data should be submitted. While in production, CAIR2 will continue to monitor submissions for data quality to ensure that data coming into CAIR2 meets minimum data quality standards. Beyond the basic HL7 content validation that occurs

during message submission, the CAIR's Data Quality Assurance (DQA) staff will look deeper into the data fields of the incoming HL7 messages for accuracy, completeness, and timeliness. Part of a future DQA follow-up process will involve generating data report cards for the Sites to let them know how their Site is doing and if there are any issues that need to be addressed. If a Site is found to have data quality below a minimum standard, CAIR DXS staff reserve the right to downgrade the Site to 'testing' status until the DQ issues are resolved.

If your site would like to monitor data exchange messaging via the 'Check Status' functionality in CAIR2, go to the CAIR Account Update webpage and add a 'Data Exchange Quality Assurance' ('DX QA') user. This read-only account does not require training and allows a user to search for patients, run reports, and monitor data exchange activity.

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

Data Exchange Resource

CDC Code Sets – One stop shop for immunization related code sets (CVX, NDC, MVX, etc.)

CDC HL7 Version 2.5.1: Implementation Guide for Immunization Messaging, Release 1.5 – Contains the tables referenced in the CAIR2 HL7 2.5.1 VXU Implementation Guide.

CAIR2 HL7 2.5.1 v1.5 Data Exchange Specifications found on the CAIR2 DX Onboarding webpage-Document for a complete and detailed overview of HL7 message requirements for CAIR2.