



IIS Onboarding Guide

Process and activities for provider organizations to establish
and test an electronic data interface with ICARE

Illinois Department of Public Health (IDPH)

City of Chicago Department of Public Health (CDPH)

Version 3, Revised 2024

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Introduction and Overview

Purpose

The State of Illinois immunization information system (IIS), I-CARE, serves two jurisdictions within Illinois: Chicago Department of Public Health (CDPH) and Illinois Department of Public Health (IDPH). Municipalities that are within the City of Chicago boundaries are supported by CDPH. Municipalities that are not within the City of Chicago are supported by IDPH.

This guide provides information about the process to establish and test an electronic data- exchange interface between an electronic health record/health information technology (EHR/health IT) system and ICARE. This process is referred to as “onboarding.” The guide is intended for use by provider organizations and the technical support team (Health IT representatives with these organizations and/or their EHR technical vendors) establishing and testing these interfaces.

Review this guide to help your provider organization prepare for each step in the onboarding process, meet testing expectations, and ensure an efficient process.

Provider sites with any sites in Illinois, (providers with sites in Illinois and Chicago) wishing to onboard with ICARE please email the IDPH IIS team at dph.icare@illinois.gov or schedule a time through [I-CARE Calendly](#).

Provider sites solely under CDPH jurisdiction, please reach out to the IIS team at CDPH.HL7@CITYOFCHICAGO.ORG or schedule a time through [HL7 Onboarding, Migration & Data Quality \(office365.com\)](#)

Onboarding process

The onboarding process involves four main steps, as outlined in Figure 1. The process outlined within this document assumes both submission and query messaging.

A query-only interface may be developed to support facilities that don’t administer vaccinations but need access to patient histories and vaccine forecasts, see [Query-only Interfaces](#).

Figure 1. Overview of the steps in the onboarding process



Complete the activities associated with each step, as detailed in this guide, to successfully onboard and maintain a quality interface with the IIS. The initial activities in

Discovery and Planning are focused on ensuring readiness to onboard and exchange data with the IIS. Complete the readiness activities to initiate an onboarding project kickoff with the IIS staff.

The time spent working intensively with the IIS staff, from onboarding project kickoff through onboarding project close (Step 1: Discovery and Planning through Step 3: Production Approval), will vary (this can range from two to six weeks) based on the type of onboarding. After close of the onboarding project, you will be expected to monitor and maintain the connection for the lifetime of the interface (Step 4: Ongoing Monitoring).

Changes to existing interfaces: retesting

Abbreviated testing protocols are used to address changes to an existing interface, including:

- Addition of new facilities (that use the same EHR/health IT system)
- Addition of query messaging to an existing submission interface
- Addition of dose-decrementing from IIS vaccine inventory

Contact the I-CARE team at dph.icare@illinois.gov or schedule a time through [I-CARE Calendly](#) if any of these situations apply. I-CARE staff will work with your organization to complete retesting of these scenarios.

Re-onboarding

Re-onboarding, or completion of the full onboarding process to establish a new interface, is required when there is a change in any of the following:

- EHR/health IT system
- Message format
- Transport

Complete an Onboarding Request via [QuickAssist HL7/EMR Updates](#) to initiate the process of re-onboarding.

Note, re-onboarding may be required when there are significant issues with a production interface that are not resolved through regular outreach and follow-up.

Query-only interfaces

A query-only interface may be developed to support facilities that don't administer vaccinations but need access to patient histories and vaccine forecasts. This connection is supported through query and response (QBP/RSP) messaging. While a query-only interface will still require stakeholders to work together to establish connectivity, the onboarding process may be abbreviated.

If you believe a query-only connection is appropriate for your organization, please schedule a meeting with the I-CARE team at dph.icare@illinois.gov or through [I-CARE Calendly](#). to obtain approval and discuss next steps.

Onboarding is a collaborative effort. Responsiveness from the provider organization representatives and EHR/Health IT to IIS requests and questions during an onboarding project ensures the process moves forward efficiently.

Onboarding Responsibilities

A successful onboarding process relies on the engagement across stakeholders: the provider organization, the EHR/health IT system technical team, and representatives from the IIS. The following table provides general information about the responsibilities of each of the primary stakeholders during and after the onboarding process.

Stakeholder	Responsibilities during onboarding	Responsibilities post onboarding (ongoing monitoring)
Provider organization staff	<ul style="list-style-type: none">• Complete all enrollment forms/paperwork and engage the EHR vendor to get onboarding resources assigned.• Identify a primary representative to be an active participant in all elements of the onboarding process and attend meetings and conference calls as appropriate.• Coordinate appropriate staff for end-user testing and troubleshooting.• Identify and resolve issues caused by improper workflows or poor data	<ul style="list-style-type: none">• Verify initial setup is correct and data from the EHR is successfully populating the production in I-CARE.• Monitor ACK interface and appropriate EHR/IIS reports to identify changes in volume or quality of messages or anything else that raises red flags about the interface.• Immediately report issues to the I-CARE and EHR contacts for assistance in troubleshooting.• Correct data entry errors and establish appropriate policies/procedures to address issues with workflow

Stakeholder	Responsibilities during onboarding	Responsibilities post onboarding (ongoing monitoring)
	<p>entry that adversely impacts data quality.</p> <ul style="list-style-type: none"> • Work with EHR vendor or organizational technical staff to resolve issues with the interface or submitted messages. 	<p>and data quality; train staff as needed.</p> <ul style="list-style-type: none"> • Communicate with I-CARE about any system changes/updates or outages that may impact existing interfaces. • Provide updated contact information for staff changes at either the organization or EHR vendor. • Notify I-CARE of any mergers, acquisitions, or closures. • Keep vaccinating!
EHR/health IT system vendor/ technical staff	<ul style="list-style-type: none"> • Provide project management and technical expertise (testing and development) on behalf of the EHR team. • Be an active participant in all elements of the onboarding process and attend all meetings and conference calls. • Ensure the EHR system aligns with HL7 transport and messaging standards. • Assist provider organizations with proper configuration of their EHR. • Work with I-CARE to identify, troubleshoot, and quickly resolve any issues with the interface or submitted messages. • Help I-CARE manage expectations about process, milestones, and timelines with the provider organization. 	<ul style="list-style-type: none"> • Assist provider organization with proper configuration of its EHR. • Train provider organization staff on how to monitor their interface (performance and ACKs) and resolve issues or seek assistance as needed. • Facilitate transition from the onboarding/implementation team to the long-term support team. • Assist with maintaining the connection and monitoring the interface for performance and errors. • Provide technical support to the provider organization and resolve any technical issues. • Maintain conformance with HL7 transport and messaging standards. <p>Notify provider organization (and possibly I-CARE) of any changes or outages that may impact existing interfaces.</p>

Stakeholder	Responsibilities during onboarding	Responsibilities post onboarding (ongoing monitoring)
I-CARE and Immunization program staff	<ul style="list-style-type: none"> • Provide general coordination/project management, communication, and customer service. • Provide specific contacts with technical and programmatic expertise. • Provide an appropriate testing/validation platform. • Communicate details about the onboarding process and thresholds for success. • Make onboarding documentation easily accessible/readily available and ensure that it is always up to date. • Provide timely feedback on message conformance and data quality. • Assist with issue identification and troubleshooting. • Manage expectations about process, milestones, and timelines. • Inform stakeholders of any system updates/changes. • Provide input on VFC and publicly funded vaccine program requirements. 	<ul style="list-style-type: none"> • Provide training on effective use of I-CARE. • Communicate ongoing expectations regarding maintaining the production interface. • Monitor data feeds for errors. • Notify organizations of any changes or outages that may impact existing interfaces. Note: this should be done as early as possible so other partners can properly prepare and execute any changes required on their end. • Continue to post updated documentation as requirements and standards evolve.

Onboarding steps - Provider Organization I-CARE Onboarding Checklist

Refer to [Appendix C](#) for a list of onboarding activities presented in checklist format, which can support project planning and resource allocation.

Step 1: Discovery and Planning

Step 1a: Readiness - Objective: Demonstrate readiness to onboard.

Complete the Onboarding Questionnaire [I-CARE HL7 Onboarding Registration and Questionnaire](#) to prepare for onboarding and data exchange with the IIS. If there is a wait list to schedule the onboarding kickoff with I-CARE, organizations will be prioritized based on several considerations, including completion of readiness activities, type of data submission and transport, participation in publicly funded vaccine programs, and length of time in the onboarding queue.

Step 1b: Kickoff - Objective: Confirm commitment to onboard.

The onboarding kickoff initiates the process of working with IIS staff to create and test an interface connection. See Table 1 for activities associated with the onboarding kickoff.

Table 1 Step1b: Kickoff activities

Complete	Activity	Description
•	Participate in an onboarding kickoff call	Ensure the full project team (HL7 Onboarding immunization and technical leads) is available to participate in the onboarding project kickoff call.
Exit Criteria	Agree to onboarding	If you are ready for onboarding and have resources committed to the project, I-CARE staff will assist with Step 2.

Step 2: Development and Testing

Objective: Establish connectivity with the testing environment, identify and address interface and data quality issues

Once an organization participates in an onboarding kickoff call and commits to proceeding, the next step is to establish connectivity between the EHR/health IT system and the IIS test environment. Table 2 lists additional details.

Table 2. Step 2a: Connectivity activities

Complete	Activity	Description
•	Use provided credentials to connect with the IIS testing environment	IDPH staff will provide the I-CARE testing endpoint (WSDL URL), and the I-CARE username and password for the new interface.
•	Troubleshoot to resolve issues as needed	Provider organizations should work with the EHR/Health IT to troubleshoot connectivity issues until connectivity is confirmed.

After connectivity is established, the next step involves testing EHR/health IT system test messages and test patient data in the IIS testing environment. I-CARE creates a mock site(s) in the test environment. Only Test patient data is used for this step. Additional details are in Table 3.

Table 3. Step 2b: Testing activities

Complete	Activity	Description
<ul style="list-style-type: none"> • 	Submit Test data to the IIS testing environment for message and data review	<p>Submitted messages (VXU) are reviewed for conformance with HL7 specifications, and locally required elements, codes and values.</p> <p><i>I-CARE staff will provide feedback on message and data review findings, including issues to address prior to proceeding to the next step.</i></p> <p>See Appendix A for further information on interpretation of IIS ACK messages.</p> <p>See Appendix B for further details on message and data review expectations.</p>
<ul style="list-style-type: none"> • 	Complete query testing	<p>Query testing ensures the ability to query I-CARE and receive expected responses in return.</p> <p>Query (QBP) messages for patients previously submitted in VXU messages and new patients to understand IIS responses (exact match, not found/no match, and too many matches).</p>
<ul style="list-style-type: none"> • 	Implement changes and resolve issues as needed to meet expectations	<p>Issues identified in testing can have several causes and may require changes to the EHR/health IT system, the interface, and/or site data entry workflow. Once changes have been made, messages will be retested. I-CARE works with organizations to resolve these issues before approval to proceed with go-live in production.</p>
<ul style="list-style-type: none"> • 	Prepare legacy data and submit for data quality review (optional)	<p>Legacy data refers to data already held in the EHR/health IT system on patients with previously administered and historical vaccinations known to your organization. Submission of these data to the I-CARE helps ensure completeness of immunization histories and accuracy of clinical decision support for all users.</p>
Exit Criteria	Receive the okay to go-live in the IIS Production environment	Once you have completed these activities, you can prepare for the go-live.

Step 3: Production Approval and Go-Live

Objective: Initiate production data exchange

Step 3 involves establishing an interface with the IIS production environment and initial monitoring to ensure continued interface success. See Table 4 lists additional details.

Table 4. Step 3: Production approval and go-live activities

Complete	Activity	Description
•	Use credentials to connect with the IIS production environment	I-CARE staff will provide the HL7 credentials for each facility/site to be included in the interface. Use these credentials to connect with I-CARE production environment and ensure all facilities/sites are included in the production interface.
•	Enable and monitor the production interface	Initiate the production interface between the EHR/health IT system and I-CARE. Ensure submission of messages from each facility/site. New production interfaces are monitored closely immediately after go- live to ensure continued submission of messages with minimal critical errors, failures, or significant issues. <i>I-CARE staff will provide feedback if issues need to be addressed prior to onboarding closeout.</i>
•	Clinically confirm query and response messaging	A physician or clinical user should confirm successful query and response messaging in the production environment, i.e., query responses are appropriately displayed in the EHR/health IT system user interface, and query responses are appropriately consumed by the EHR/health IT system if applicable.
•	Troubleshoot to resolve issues as needed to meet expectations	Organizations are required to address identified issues before closing out the onboarding project. If there are significant issues identified at this step, an organization may be asked to go back to Step 2b: Testing to address problems.
•	Submit legacy data (optional)	Work with I-CARE staff to submit legacy data.
•	Confirm onboarding close	Work with IIS staff to confirm all activities associated with onboarding are complete. Ensure appropriate resources are allocated to ongoing interface monitoring and maintaining quality data submission for the lifetime of the interface.
Exit Criteria	Receive confirmation of onboarding project close	I-CARE staff will notify you of onboarding project close.

Step 4: Ongoing Monitoring

Objective: Ensure successful ongoing exchange

The final step of the onboarding process is to transition to ongoing monitoring and maintenance for the lifetime of the interface. Detailed activities associated with this step are outlined in Table 5 below.

Table 5. Step 4: Ongoing monitoring activities

Complete	Activity	Description
Ongoing	Conduct ongoing interface monitoring	Monitor I-CARE acknowledgment messages to ensure successful submission.
Ongoing	Resolve errors	Follow up on and address errors noted in acknowledgment messages as needed. See Appendix A for further information on interpretation of IIS ACK messages.
Ongoing	Conduct ongoing interface maintenance	Maintain the interface by ensuring new codes are added as applicable.
Ongoing	Maintain quality data submission	Use I-CARE reports to support immunization practice. Follow up on data submission and data quality issues as needed.

Appendix A. Interpreting ACK Messages¹

MSA-1 Value	Description	National IG Description	ERR segment(s) and ERR-4 severity	Understanding of IIS Response	Sender Follow-up Expectation
AA	Application acknowledgment: accept	Message accepted and processed.	No error (ERR) segments.	Message accepted.	No action needed.
			ERR segment(s) with severity of “I” for information . (No severity “W” or “E” errors).	Message accepted with returned information.	
AE	Application acknowledgment: error	Message accepted and processed, and errors are being reported.	At least one ERR segment with severity of “W” for warning . (No severity “E” errors)	Message accepted but there may be issues. These may include nonfatal errors with potential for loss of data.	Take action to correct issue(s) in sending system. *
			At least one ERR segment with severity of “E” for error .	Message and/or data rejected. The IIS rejected data that it views as important.	Take action to correct issue(s) in sending system and resubmit. *
AR	Application acknowledgment: reject	Message rejected due to: <ul style="list-style-type: none"> • Unsupported message type • Unsupported event code • Unsupported processing ID • Unable to process for reasons unrelated to format or content 	At least one ERR segment with severity of “E” for error , with 1 of 4 conditions specified.	Message rejected. The message was not processed.	Take action to correct issue(s) in sending system and resubmit. *

*If the cause of the issue is determined to be the sending system. In some cases, the issue may be due to the IIS; work with IIS staff to identify the cause of the issue and appropriate next steps.

¹ Adapted from [Guidance for HL7 Acknowledgement Messages to Support Interoperability](#)

Appendix B. Message and Data Review

Organizations are expected to submit messages with minimal critical errors, failures, or significant issues. These messages must contain high-quality data representing your patients and immunization practices. During Step 2b: Message and data review, I-CARE staff will provide feedback on message and data review findings, including issues that must be addressed prior to proceeding in the process. Testing is expected to be completed within a two-week period; however, this timeline will be extended in one-week increments until issues are sufficiently addressed. Provider organization and EHR/health IT representatives are expected to work in collaboration with I-CARE staff to resolve issues identified in testing.

Sample items reviewed during message and data review are noted below. **Message review**

- Conformance to HL7 specifications, including local requirements:
 - Appropriate use of delimiters
 - Appropriate cardinality (presence and repetition of elements)
 - Appropriate implementation of usage
 - Appropriate element length
 - Appropriate use of data types
 - Appropriate codes/values for coded elements
- Minimal critical errors, failures, or significant issues, as indicated in ACK messages:
 - No messages resulting in AR (application reject)
 - Minimal messages resulting in AE due to severity “E” and severity “W” errors

Data review

Validity and accuracy

- Vaccines administered by the organization are represented in the data received by the IIS.
- Administered vaccinations have active and specific CVX/NDC codes (not “unspecified” CVX codes).
- Historical vaccinations have historically correct CVX codes.
- Vaccination encounter date must not be before a patient date of birth.
- Vaccination encounter date must be less than or equal to (before or the same as) the submission date.
- Every administered vaccine should be recorded as a single vaccination event (i.e., a combination vaccine should be recorded as one event rather than separate events for each antigen).
- Vaccination encounter date should not be the same as the patient date of birth, unless it is recommended for administration on the date of birth, e.g., hepatitis B.
- Manufacturer and CVX/NDC code should not contradict one another.
- Route and site should not contradict each other for a given vaccine type and patient age.

Completeness

- The volume of vaccines submitted appropriately reflects the organization's immunization practice for a given time.
- Submission of data from each facility/site is associated with the organization, appropriately identified in HL7 messages, and mapped to the organization/facility /Site record within the IIS.
- Submission reflects appropriate proportion of historical and administered vaccinations, given the organization's immunization practice.
- Submission of key data elements associated with patient immunizations includes:
 - Medical record number/client ID
 - Patient name (first and last)
 - Mother's maiden name (if the patient is a minor)
 - Patient date of birth
 - Patient race
 - Patient ethnicity
 - Patient gender
 - Patient address
 - Patient phone
 - Mother/father/guardian, aka next of kin (if the patient is a minor)
 - Vaccination encounter date
 - Vaccine administered product type (CVX/NDC)
 - Administered/historical indicator (unless refused/not administered)
- Submission of key data elements for administered vaccines includes:
 - Lot number
 - Vaccine lot expiration date
 - Dosage (administered amount)
 - Manufacturer
 - Dose-level vaccine eligibility, aka vaccine funding program eligibility
 - Vaccine funding source
 - Route
 - Body site

Depending on data review findings, provider organizations may also be asked to participate in patient record review to compare IIS data to the originating medical record. IIS staff will work with you if needed to complete this record review/chart audit.

Appendix C. IIS Onboarding Checklist

Table 9. Provider organization IIS onboarding checklist

Step/Activity	Resources	Status
Step 1: Discovery and Planning		
Step 1a: Readiness		
Enroll in the IIS	I-CARE Online Enrollment	
Ensure technical capabilities to support immunization data exchange	Ensure your EHR/health IT system can support SOAP Web Services, using the CDC SOAP Information (WSDL) and IIS Health Level 7 (HL7) Implementation Guide (IG)	
Complete the Onboarding Registration and Questionnaire	I-CARE HL7 Onboarding Registration and Questionnaire	
Prepare for onboarding and data exchange with the I-CARE	I-CARE Local Implementation Guide for Immunization Messaging And I-CARE HL7 Values	
Step 1b: Kickoff		
Ensure resource allocation	Dedicate a project lead from site and EHR/Health IT	
Participate in a kickoff call	I-CARE sends invitation for online meeting	
Step 2: Development and Testing		
Step 2a: Connectivity		
Implement credentials to connect with the I-CARE testing environment		
Troubleshoot to resolve issues as needed		
Step 2b: Testing		
Submit Test Patient messages (VXU) to the I-CARE testing environment for message and data review		
Complete query testing (QBP)		
Implement changes and resolve issues as needed to meet expectations		
Prepare legacy data and submit for data quality review (optional)		

Step 3: Production Approval and Go-Live		
Implement credentials to connect with the I-CARE production environment		
Enable and monitor the production interface		
Clinically confirm query and response messaging		
Troubleshoot to resolve issues as needed to meet expectations	I-CARE Site Reports for VFC, Data Quality, Coverage Levels	
Submit legacy data (optional)		
Confirm onboarding close		
Step 4: Ongoing Monitoring		
Conduct ongoing interface monitoring		
Resolve errors		
Conduct ongoing interface maintenance		
Maintain quality data submission		