CIR HL7 Onboarding Checklist and Guide

Version history

Version	Date	Notes
1.0	02/17/2022	
1.1	05/22/2023	

Table of Contents

Onboarding Readiness Checklist

This checklist is intended as a resource for provider organizations to reference and complete on their own.

This checklist is for you if your organization falls into one of the categories below:

- Administers vaccines within New York City's five boroughs or would like to query patient immunization histories within our jurisdiction
- Participates in the COVID-19 Vaccine Program, Vaccines for Children (VFC) program, or Promoting Interoperability EHR Incentivized programs for the immunization registry public health measure
- Already connects with the Citywide Immunization Registry (CIR), New Yor City's immunization information system (IIS), but is switching Electronic Health Records (EHR) vendors or health IT systems
- Would like to upgrade to a bidirectional interface connection
- Managed care organization looking to bulk query with HL7

An electronic interface between your organization's EHR/health IT system and CIR supports ongoing, real-time transfer of data between these systems. Once established, this interface connection supports the submission of immunization record information from the provider organization to the CIR. It can also support querying the CIR for patient immunization histories and forecasts, without leaving the EHR/health IT system workflow.

If you are interested in data exchange with the CIR, work with your technical vendor to review and complete the activities below to ensure your system is capable of electronic exchange with the CIR and your organization is prepared for the onboarding process.

If you have any questions, reach out to the **CIR interoperability team at cir_interop@health.nyc.gov.**

1. Enroll in the CIR

- ❑ **A. Complete CIR facility manager registration to receive a CIR facility code and be authorized to access the CIR**
  - Ensure all facilities/sites associated with your organization are also properly enrolled in the CIR.
- ❑ **B. Sign CIR's Health Care Provider Confidentiality Statement and ask your EHR/health IT vendor to sign a copy of the CIR's Vendor Confidentiality Statement.**
  - Ensure all facilities/sites associated with your organization also sign their own data confidentiality forms.
  - If you are a health plan, you must sign different data confidentiality agreements, which are linked in the **HL7 Bulk Immunization Records Onboarding guide**.
- ❑ **C. Register for Online Registry account(s)** to report and lookup patients, manage your vaccine inventory, and perform other vaccine management tasks by signing Site Security Administrator forms. For more information about the online registry, review the Online Registry Guide.

2. Work with your technical vendor to ensure technical capabilities

- ❑ **A. Ensure your EHR/health IT system can support SOAP Web Services, using the CDC WSDL.**
  Secure transport of data between an EHR/health IT system and the CIR is supported through use of SOAP Web Services and a Centers for Disease Control and Prevention (CDC) Web Services Description Language (WSDL). Work with your vendor/IT staff to ensure WSDL implementation.

- ❑ **B. Ensure your EHR/health IT system can support HL7 v2.5.1 immunization messaging.**
  Immunization data exchange is supported through use of Health Level Seven (HL7) version 2 messaging. The HL7 v2.5.1 Implementation Guide for Immunization Messaging (National IG), Release 1.5 and Addendum provides specifications for use of this format to support standards-based exchange of immunization data.

EHRs and health IT systems certified under the ONC Health IT Certification Program,[1] editions 2015 and 2015 Cures Update, are capable of HL7 immunization data exchange with the CIR. Check with your technical vendor about this capability and certification status.

The **CIR's implementation Guide** provides further instructions. There are a few significant differences between national guidance and our requirements. For example, historical vaccinations must be reported with administering location. This and other differences are detailed in our CIR **onboarding guide**.

- ❑ **C. Use the National Institute of Standards and Technology (NIST) testing tools to complete self-service testing.** Have your technical vendor test your EHR/health IT system capabilities using NIST's Immunization Test Suite. Use these tools to demonstrate SOAP Web Services and HL7 v2.5.1 capabilities and troubleshoot issues before engaging with the CIR.

3. Complete CIR onboarding registration intent and questionnaire form

- ❑ **A. Complete the Onboarding registration intent and questionnaire, available at https://forms.office.com/g/i61Uavn0e5.**
  Register your intent to onboard and exchange data with the CIR. Provide basic information about your organization, including the name, address, number of associated facilities/sites, and general information about your EHR/health IT system.

  Provide detailed information about your organization's patient population, immunization practices, and associated facilities/sites. Work with your technical vendor to provide detailed information about your EHR/health IT system, including capabilities supporting data exchange and ongoing interface monitoring. This information supports data-quality testing in the onboarding process.

4. Prepare for onboarding and data exchange with the CIR

- ❑ **A. Review the local Implementation Guide for Immunization Messaging (Local IG) https://www.nyc.gov/assets/doh/downloads/pdf/cir/hl7-web-service-integration-guide251.pdf.**
  Review local HL7 messaging requirements and constraints on the National IG. Review locally accepted codes and values, to understand where national code and value sets are constrained or extended to support data exchange with the CIR.

- ❑ **B. Review the Onboarding Guide**
  Review the steps and activities involved in the onboarding process. Review expectations and responsibilities during onboarding as well as after onboarding, once the interface is "live." Ensure sufficient resource allocation to support the onboarding project and ongoing monitoring and maintenance of the interface.

Completion of the CIR enrollment process and data confidentiality forms, Onboarding Questionnaire will place your organization in queue to be invited to an onboarding kickoff call, as CIR interoperability resources allow. An onboarding kickoff call initiates the process of establishing connectivity between your EHR/health IT system and the CIR.

Please email cir_interop@health.nyc.gov with questions or concerns.

[1] https://www.healthit.gov/topic/certification-ehrs/certification-health-it

HL7 Onboarding Guide

Process and activities for provider organizations to establish and test an electronic data interface with the Citywide Immunization Registry (CIR).

Introduction and Overview

Purpose

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 the New York City's immunization information system (IIS), the CIR. This process is referred to as "onboarding." This guide is intended for use by provider organizations and representatives associated with these organizations or their technical vendors to support establishing and testing these interfaces. Review this guide to help your organization prepare for each step in the onboarding process, meet testing expectations, and ensure an efficient process.

If you have questions about onboarding with the CIR, contact the CIR interoperability team at cir_interop@health.nyc.gov.

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; see Query-only interfaces if the interface will not include submission to the IIS.

Figure 1. Overview of the steps in the onboarding process

Complete required activities associated with each step, as detailed in this guide, to successfully onboard and maintain a quality interface with the CIR. The initial activities in Step 1: Discovery and Planning are focused on ensuring readiness to onboard and exchange data with the CIR. Complete the readiness activities as highlighted in the Readiness Checklist to initiate an onboarding project kickoff with the CIR interoperability staff.

The time spent working intensively with the CIR interoperability staff, from onboarding project kickoff through onboarding project close (Step 1: Discovery and Planning through Step 3: Production Approval), should take approximately six weeks. After close of the onboarding project, you will need to monitor and maintain the connection for the lifetime of the interface (Step 4: Ongoing Monitoring).

Resource allocation

Organizations are expected to ensure resource allocation across the following roles to support onboarding and ongoing monitoring. Depending on the size of your organization, these roles may be fulfilled by one or more individuals:

- **Onboarding project lead**: Person responsible for oversight and coordination of the organization's onboarding efforts
- **Onboarding technical lead/interface technician**: Person responsible for establishing and testing the interface between the EHR/health IT system and CIR (usually an EHR/health IT vendor representative)
- **Immunization lead**: Person responsible for immunization data quality and ensuring clinical confirmation of query and response messaging
- **Interface production technical lead**: Person responsible for maintaining and monitoring the production interface once established

Organizational representatives must be responsive to CIR requests and questions during an onboarding project to ensure the process moves forward efficiently. Organizations that are not responsive will have their onboarding projects placed on hold until sufficient resources are allocated. Review Appendix_A._Onboarding for additional information on responsibilities across stakeholders, during and after the onboarding process.

Onboarding steps and activities

Additional detail on the activities associated with each step in the onboarding process is provided in Table 1. Review this table and the accompanying narrative to help ensure a successful onboarding project. Refer to Appendix B for a list of onboarding activities presented in checklist format, which can support project planning and resource allocation.

Table 1. CIR onboarding steps and activities

Step	1: Discovery and Planning		2: Development and Testing		3: Production Approval and Go-Live	4: Ongoing Monitoring
	1a: Readiness	1b: Kickoff	2a: Connectivity	2b: Testing		
Objective	Demonstrate readiness to onboard	Confirm commitment to onboard	Establish connectivity with the CIR testing environment	Identify and address interface and data quality issues	Initiate production data exchange	Ensure successful ongoing exchange
Duration		[1 week]	[1 week]	[2 weeks*]	[2 weeks*]	Ongoing
Required Activities	❑ Enroll in the CIR ❑ Ensure technical capabilities to support immunization data exchange ❑ Complete CIR onboarding registration intent and questionnaire form ❑ Prepare for onboarding and data exchange with the CIR	❑ Ensure resource allocation ❑ Participate in an onboarding kickoff call to review the onboarding process	❑ Implement credentials to connect with the CIR testing environment ❑ Troubleshoot to resolve issues as needed	❑ Submit production data to the CIR testing environment for message and data review ❑ Complete query live demo testing, if applicable ❑ Implement changes and resolve issues as needed to meet expectations ❑ Prepare legacy data and submit for data quality review	❑ Implement credentials to connect with the CIR production environment ❑ Enable and monitor the production interface ❑ Clinically confirm query and response messaging ❑ Troubleshoot to resolve issues as needed to meet expectations ❑ Submit legacy data ❑ Confirm onboarding close	❑ Conduct ongoing interface monitoring ❑ Take action to resolve errors ❑ Conduct ongoing interface maintenance ❑ Maintain quality data submission
Exit Criteria	✔ Receive an invitation to onboard	✔ Agree to proceed; commit to onboarding	✔ Confirm successful connectivity with CIR testing environment	✔ Receive approval to proceed with go-live	✔ Receive confirmation of onboarding close	

***Subject to extension in one-week increments to ensure issues are sufficiently resolved to meet CIR expectations**

Step 1: Discovery and Planning

Step 1: Discovery and Planning includes two sub-steps, 1a: Readiness and 1b: Kickoff.

Step 1a: Readiness

Objective: Demonstrate readiness to onboard

Complete readiness activities to prepare for onboarding and data exchange with the CIR. Table 2 lists additional details for each of the required activities. Once these activities are completed and as CIR resources allow, you will receive an invitation to participate in an onboarding kickoff call with CIR interoperability staff.

If there is a wait list to schedule the onboarding kickoff with the CIR, organizations will be prioritized based on several considerations, including:

- Completion of the readiness activities
- Participation in the Vaccines for Children (VFC) program
- Volume of immunizations administered
- Types of immunizations administered
- Number of associated facilities
- Organization type
- Patient population served
- Length of time in the onboarding queue

Table 2. Step 1a: Readiness activities

Complete	Activity	Description
•	Enroll in the CIR Date: _____	Ensure your organization is currently enrolled in the CIR by logging into the **facility manager registration**. Ensure all facilities associated with your organization are also properly enrolled in the CIR.
•	Sign data confidentiality agreements Date(s): _____	Ensure all facilities associated with your organization sign their own **CIR's Health Care Provider Confidentiality Statement** and ask your EHR/ Health IT to sign a copy of the **CIR's Vendor Confidentiality Statement**. Managed care organizations/health plans are required to sign a different confidentiality agreement. See **Query-only interfaces** for further instructions.
•	Sign up for access to the CIR web portal Date: _____	Ensure your facility has access to the CIR's web portal, the online registry for access to participate in vaccination programs, vaccine ordering, managing inventory, adding or updating patient or immunization records, looking up patients' immunization history, and running reports. For access, visit the access form page.
•	Ensure technical capabilities to support immunization data exchange	Work with your technical vendor to ensure technical capabilities, including support for **SOAP Web Services using the CDC WSDL** and support for **HL7 v2.5.1, Release 1.5 immunization messaging**. EHRs and health IT systems certified under the ONC Health IT Certification Program,2 editions 2015 and 2015 Cures Update, are capable of HL7 v2.5.1 messaging with IIS. Check with your technical vendor about your system's certification status. Your technical vendor can use the National Institute of Standards and Technology (NIST) **Immunization Test Suite** to complete self-service testing of these capabilities.
•	Complete Onboarding Registration Intent Form and Questionnaire Date: _____	First, complete the Onboarding Registration form to register your intent to exchange data with the IIS. Provide basic information about your organization, your facilities, and your EHR/health IT system. Next, work with your technical vendor to complete the Questionnaire portion of the form. Provide detailed information about your EHR/health IT system capabilities and your organization's immunization practices to inform onboarding testing.
•	Prepare for onboarding and data exchange with the CIR	Review New York City's HL7 v2.5.1 Local Implementation Guide **CIR HL7 Web Service Implementation Guide (IG) v 1.5** for local specifications for immunization messaging with the CIR. Review this onboarding guide to understand the steps and activities involved in the onboarding process.

[2] https://www.healthit.gov/topic/certification-ehrs/certification-health-it

Exit Criteria	Receive an invitation to onboard	Completion of the CIR enrollment, the Onboarding Registration, and the Onboarding Questionnaire will place your organization in queue to be invited to an onboarding kickoff call as CIR interoperability resources allow.

Step 1b: Kickoff

Objective: Confirm commitment to onboard

The onboarding kickoff initiates the process of working with CIR interoperability staff to create and test an interface connection. See Table 3 for activities associated with the onboarding kickoff.

Table 3. Step 1b: Kickoff activities

Complete	Activity	Description
•	Ensure resource allocation	Ensure resources are identified and allocated to fulfilling the following roles: • Onboarding project lead • Onboarding technical lead/interface technician • Immunization lead • Interface production technical lead
•	Participate in an onboarding kickoff call	Ensure the full project team is available to participate in the onboarding project kickoff call. The kickoff will provide an opportunity to discuss provider organization readiness, review the onboarding process, discuss onboarding expectations, discuss options for submission of legacy data, and address questions.
Exit Criteria	Agree to proceed; commit to onboarding; schedule kickoff call Date: _____	If you are ready to proceed with the process as outlined in the onboarding kickoff and have resources committed to the project, CIR staff will invite you to proceed with Step 2.

Step 2: Development and Testing

Step 2: Development and Testing consists of two sub-steps, 2a: Connectivity and 2b: Testing.

Step 2a: Connectivity

Objective: Establish connectivity with the CIR testing environment

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 CIR environment used for testing. Table 4 lists additional details for each of the required activities associated with this step.

Table 4. Step 2a: Connectivity activities

Complete	Activity	Description
•	Implement credentials to connect with the CIR testing environment Date: _____	CIR interoperability staff will provide the CIR testing endpoint (also known as the WSDL URL), a CIR username and CIR password specific to your organization, and CIR facility IDs for each facility/site to be included in the interface. Use these credentials to connect with the CIR testing environment and ensure all facilities/sites are included in the interface.
•	Troubleshoot to resolve issues as needed	Provider organizations are expected to troubleshoot connectivity issues until connectivity is confirmed.
Exit Criteria	Confirm successful connectivity with CIR testing environment Date: _____	CIR interoperability staff will work with you to confirm successful connectivity.

Web Service URLS

CIR UAT End Point URL:	https://immunize.nyc/hl7-service-uat/services/CirService
CIR UAT WSDL:	https://immunize.nyc/hl7-service-uat/services/CirService?wsdl
CIR PROD End Point URL:	https://immunize.nyc/hl7-service-prod/services/CirService
CIR PROD WSDL:	https://immunize.nyc/hl7-service-prod/services/CirService?wsdl

Step 2b: Testing

Objective: Identify and address interface and data quality issues

After connectivity is established, the next step involves testing EHR/health IT system production messages and data in the CIR testing environment. Use of real patient data gives the best depiction of the quality of exchange between the two systems in production. Submit 2 weeks work of data in real time or 2 weeks of legacy data. You may submit test data as well. You may create test data using our HL7 VXU test case guide. However, the CIR will only validate real patient data. Table 5 lists additional details for each of the required activities associated with this step.

Table 5. Step 2b: Testing activities

Complete	Activity	Description
•	Submit production data to the CIR testing environment for message and data review	Messages are reviewed to ensure conformance with HL7 specifications, including submission of locally CIR required elements and locally CIR accepted codes and values. In addition, aggregated data from submitted messages is reviewed to ensure validity, accuracy, and completeness. ***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. CIR staff will provide feedback on message and data review findings, including issues that must be addressed prior to proceeding in the process***. See Appendix C for further information on interpretation of CIR ACK messages. See Appendix D for further details on message and data review expectations.
•	Complete query testing Date: _____	Query testing ensures the ability to query the CIR and receive expected responses in return. Query for patients previously submitted in VXU messages and new patients A live demo is requested where the organization is asked to query several CIR test patients to understand CIR responses (exact match, not found/no match, and too many matches). See QBP demo guide for more on the query testing process.
•	Implement changes and resolve issues as needed to meet expectations	Issues identified in testing can have several causes and may require changes to the EHR/health IT system, the interface, or workflow. Once changes have been made, messages will be retested to ensure that the issues have been satisfactorily resolved. Organizations are required to address these issues before receiving an approval to proceed with go-live. ***Testing will be extended in one-week increments until issues are sufficiently addressed.***
•	Prepare legacy data and submit	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 CIR

	for data quality review	helps ensure completeness of CIR immunization histories and accuracy of CIR clinical decision support for all users. See the AIRA guidance document, *Importing Legacy Data to Improve IIS Saturation*[3] for further information.
Exit Criteria	Receive approval to proceed with go-live	Once you have completed these activities, you will receive an approval to proceed with go-live.

Step 3: Production Approval and Go-Live

Objective: Initiate production data exchange

Step 3 involves establishing an interface with the CIR production environment and initial monitoring to ensure continued interface success. See Table 6 for activities associated with this step.

Table 6. Step 3: Production approval and go-live activities

Complete	Activity	Description
•	Implement credentials to connect with the CIR production environment Date: _____	CIR staff will provide the CIR production endpoint (WSDL URL), an CIR username and CIR password specific to your organization, and CIR facility IDs for each facility/site to be included in the interface. Use these credentials to connect with the CIR 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 the CIR. 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. See Appendix C for further information on interpretation of IIS ACK messages. ***CIR staff will provide feedback on any issues that must be addressed prior to onboarding closeout.***
•	Clinically confirm query and response messaging	A physician or clinical user must 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. ***Immediate post-go-live monitoring will be extended in one-week increments until issues are sufficiently addressed.***

[3] https://repository.immregistries.org/resource/importing-legacy-data-to-improve-iis-saturation/

		If there are significant issues identified at this step, an organization may be required to go back to Step 2b: Testing to address problems.
•	Submit legacy data Date: _____	Work with CIR staff to submit legacy data.
•	Confirm onboarding close	Work with CIR staff to confirm all activities associated with onboarding are complete. Review post-onboarding responsibilities (see Appendix A). 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 Date: _____	CIR 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 7 below.

Table 7. Step 4: Ongoing monitoring activities

Complete	Activity	Description
Ongoing	Conduct ongoing interface monitoring	Monitor CIR acknowledgment messages to ensure successful submission.
Ongoing	Resolve errors	Follow up on and address errors noted in acknowledgment messages as needed. See Appendix C 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 CIR Online Registry reports to support immunization practice. Follow up on data submission and data quality issues as needed.

Special Topics

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 shortened. If you believe a query-only connection is appropriate for your organization, contact the CIR team at cir_interop@health.nyc.gov to obtain approval and discuss next steps.

If your organization is a managed care organization, follow the instructions found in the health plan checklist.

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 CIR vaccine inventory

Contact the CIR team at cir_interop@health.nyc.gov if any of these situations apply. CIR staff will work with your organization to complete retesting in 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 EHR/health IT system.

Complete an Onboarding Registration Intent and Questionnaire form 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.

Appendices

Appendix A. Onboarding Responsibilities

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

Table 8. Stakeholder responsibilities during and after the CIR onboarding process

Stakeholder	Responsibilities during onboarding	Responsibilities post onboarding (ongoing monitoring)
CIR and immunization program staff	• 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 requirements.	• Provide training on effective use of the CIR. • 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 partners can properly prepare and execute any changes required on their end. • Continue to post updated documentation as requirements and standards evolve.
Provider organization staff	• Complete all necessary 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/conference calls as appropriate. • Provide production or production-quality data for testing and validation. • Coordinate appropriate staff for end-user testing and troubleshooting. • Identify and resolve issues caused by improper workflows or poor data entry that adversely impact data quality.	• Verify initial setup is correct and data from the EHR is successfully populating the production IIS. • Monitor ACK interface and appropriate EHR/CIR 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 IIS and EHR contacts for assistance in troubleshooting. • Correct data entry errors and establish appropriate policies/procedures to address issues with workflow and data quality; train staff as needed.

	• Work with EHR vendor or organizational technical staff to resolve issues with the interface or submitted messages.	• Communicate with CIR 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 the CIR of any mergers, acquisitions, or closures. • Keep vaccinating!
EHR/health IT system vendor/ technical staff	• 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/conference calls. • Ensure the EHR system aligns with HL7 transport and messaging standards. • Work with CIR to identify, troubleshoot, and quickly resolve any issues with the interface or submitted messages. • Help CIR manage expectations about process, milestones, and timelines with the provider organization. • Assist provider organizations with proper configuration of their CIR.	• 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. • Notify provider organization (and possibly CIR) of any changes or outages that may impact existing interfaces.

Appendix B. IIS Onboarding Checklist

Table 9. Provider organization IIS onboarding checklist

Step/Activity	Resources	Status	Date
Step 1: Discovery and Planning			
Step 1a: Readiness			
Enroll in the CIR			
Sign data confidentiality forms			
Obtain access to CIR web portal, the online registry			
Ensure technical capabilities to support immunization data exchange			
Complete the Onboarding Registration Intent and Questionnaire Form			
Prepare for onboarding and data exchange with the IIS			
Step 1b: Kickoff			
Ensure resource allocation			
Participate in a kickoff call			
Step 2: Development and Testing			
Step 2a: Connectivity			
Implement credentials to connect with the CIR testing environment			
Troubleshoot to resolve issues as needed			
Step 2b: Testing			
Submit 2 weeks of production messages to the CIR testing environment for message and data review			
Complete query testing, if applicable			
Implement changes and resolve issues as needed to meet expectations			
Prepare legacy data and submit for data quality review			
Step 3: Production Approval and Go-Live			
Implement credentials to connect with the CIR production environment			
Enable and monitor the production interface			
Clinically confirm query and response messaging			
Troubleshoot to resolve issues as needed to meet expectations			
Submit legacy data			
Confirm onboarding close			
Step 4: Ongoing Monitoring			
Conduct ongoing interface monitoring			
Resolve errors			
Conduct ongoing interface maintenance			
Maintain quality data submission			

Appendix C. Interpreting ACK Messages[4]

The CIR ACK messages do deviate from the CDC ACK messages. Messages that were processed but had important data missing or incorrect data are rejected, such that the MSA-1 value is 'AR'.

MSA-1 Value	Description	CIR 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.
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.*
AR	**Application acknowledgment: reject**	Message rejected, and errors are reported	At least one ERR segment with severity of "**E**" for **error**.	Message and/or data rejected. The CIR rejected data that it views as important.	Take action to correct issue(s) in sending system and resubmit.*
		Message rejected due to: • 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.

[4] Adapted from Guidance for HL7 Acknowledgement Messages to Support Interoperability

Appendix D. 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, CIR 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 CIR staff to resolve issues identified in testing.

Sample items reviewed during message and data review are noted below. For all data elements reviewed, see the VXU message checklist.

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 CIR.
- 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 CIR for both historical and administered vaccinations.
- 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, mobile phone
    - Patient protection indicator (if the patient is 19+ years old)
    - 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
- Submission of key data elements associated with the licensed clinician providing the service:
    - Ordering provider New York State license number or NPI number

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

Appendix E. CIR Local Requirements/Differences

The CIR has local differences and deviations from the CDC HL7 IG. Review the table below and consult the CIR HL7 Local implementation guide for more information such as value sets.

Table 10. CIR HL7 Local Differences

Element	Description
Protection Indicator for Adults 19+	New York State (NYS) requires that all adults provide consent to share or consent to not share with New York City and NYS registries. Refer to the CIR IG to verify how the CIR handles consent to share, consent to not share and consent not collected.
Patient Gender	CIR accepts a greater list of values. Refer to the CIR IG.
Patient Race	CIR accepts a greater list of values. Refer to the CIR IG.
Patient Ethnicity	CIR accepts a greater list of values. Refer to the CIR IG.
Administered Location	CIR requires that administered location is populated with the reporting location CIR facility code for all historical vaccinations.
Errors in Response Message	CIR will return all errors and warnings found in a query.
Gender Identity	CIR accepts a gender identity. If your system is interested in reporting this information, refer to the CIR IG for guidance.