HL7 MCIR Onboarding Guide

Process and activities for provider organizations to establish and test an electronic data interface with Michigan Care Improvement Registry (MCIR).

[MDHHS/Michigan Care Improvement Registry]
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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 Michigan Care Improvement Registry, MCIR. This process is referred to as “onboarding.” This guide is intended for use by provider organizations and representatives associated with these organizations and 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 Michigan, please reach out to the MCIR team at MDHHS-HL7@michigan.gov.

Onboarding process

The onboarding process involves four main steps, as outlined in Figure 1. The process outlined within this document assumes both submission (VXU) and query (QBP) messaging; see Special Topics: Query-only interfaces if the facility does not provide immunizations.

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 MCIR. The initial activities in Step 1: Discovery and Planning are focused on ensuring readiness to onboard and exchange data with MCIR. Complete the readiness activities as highlighted in the Provider Checklist [Onboarding Provider Checklist] to initiate an onboarding project kickoff by completing the HSTR registration.

The time spent working intensively with the MCIR staff, from onboarding project kickoff through onboarding project close (Step 1: Discovery and Planning through Step 3: Production Approval), should take approximately six weeks if each step is followed correctly. The process is provider driven and can take over 6 weeks to complete. 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).

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 MCIR (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 MCIR 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 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. MCIR 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 MCIR 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 MCIR ❑ Ensure technical capabilities to support immunization data exchange ❑ Complete MCIR onboarding form :HSTR registration (MI Health System Testing Repository) Home Page - HSTR (michiganhealthit.org)	❑ Prepare for onboarding and data exchange with the MCIR	❑ Implement credentials to connect with the MCIR testing environment ❑ Troubleshoot to resolve issues as needed	❑ Submit production data to the MCIR testing environment for message and data review ❑ Implement changes and resolve issues as needed to meet requirements ❑ Complete provider onboarding roles and responsibilities	❑ Participate in a "go live" training with the Education and Training Team prior to going live in production ❑ Enable and monitor the production interface ❑ 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 submit data	✔ Agree to proceed; commit to onboarding	✔ Confirm successful connectivity with MCIR 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 MCIR expectations**

Step 1: Discovery and Planning (Week one)

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 MCIR. Table 2 lists additional details for each of the required activities. Once the HSTR registration is completed, you will receive an invitation with the credentials to submit live patient data to the MCIR test environment from a member of the data quality team.

Complete

1. Enroll in the MCIR [MCIR_Provider_User-Usage_Agreement-easy-fill-8262019.pdf]
    - Ensure you organization is currently enrolled in the MCIR by completing MCIR Provider User-Usage Agreement.
2. Ensure technical capabilities to support immunization data exchange.
    - Work with your technical vendor to ensure technical capabilities, SOAP Web Services using the CDC WSDL and support for HL7 v2.5.1, Release 1.5 immunization messaging.
    - Your technical vendor can use the National Institute of Standards and Technology (NIST) Immunization Test Suite to complete self-service testing of these capabilities.
3. Complete MCIR onboarding form: registration [Home Page - HSTR (michiganhealthit.org)]
    - First, complete the Onboarding Registration form [Home Page - HSTR (michiganhealthit.org)] to register your intent to exchange data with the MCIR. Provide basic information about your organization, your facilities, and your EHR/health IT system.

Table 2. Step 1a: Readiness activities

Complete	Activity	Description
•	Enroll in the MCIR [MCIR_Provider_User-Usage_Agreement-easy-fill-8262019.pdf]	Ensure your organization is currently enrolled in the MCIR by completing MCIR Provider User-Usage Agreement. Ensure all facilities associated with your organization are also properly enrolled in the MCIR.

•	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,[1] editions 2015 and 2015 Cures Update, are capable of HL7 v2.5.1 messaging with MCIR. 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 MCIR onboarding form: registration [Home Page - HSTR (michiganhealthit.org)]	First, complete the Onboarding Registration form [Home Page - HSTR (michiganhealthit.org)] to register your intent to exchange data with the MCIR. Provide basic information about your organization, your facilities, and your EHR/health IT system.
•	Prepare for onboarding and data exchange with the MCIR	Review the MCIR HL7 v2.5.1 Local Implementation Guide [MCIR HL7 2.5 Specification] for local specifications for immunization messaging with the MCIR. Review this onboarding guide to understand the steps and activities involved in the onboarding process.
Exit Criteria	Receive an invitation to onboard	Completion of the HSTR Onboarding Registration will place your organization in queue to be reviewed by the data quality analyst. If additional information is needed, the analyst will reach out via the email provided at registration. If you have questions when

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

		completing registration, please email the data quality team at MDHHS-HL7@michigan.gov.

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 MCIR testing environment. Use of real patient data gives the best depiction of the quality of exchange between the two systems in production. Table 5 lists additional details for each of the required activities associated with this step. Once the data quality analyst assigned to your onboarding project alerts you of passing the testing process, they will request that you work with your technical vendor to complete the Onboarding roles and responsibilities questionnaire [MCIR Transfer: Provider Site Responsibilities]. Provide detailed information about your EHR/health IT system capabilities and your organization's immunization practices *after* completing onboarding testing.
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Table 5. Step 2b: Testing activities

Complete	Activity	Description
•	Submit production data to the MCIR testing environment for message and data review	Messages are reviewed to ensure conformance with HL7 specifications, including submission of locally required elements and locally accepted codes and values. At least 5 messages are expected before data quality analysis can be provided. In addition, aggregated data from submitted messages is reviewed to ensure validity, accuracy, and completeness. ***Organizations are expected to submit messages with no errors, failures, or significant issues. These messages must contain high-quality data representing your patients and immunization practices. MCIR data quality team 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 MCIR ACK messages. See Appendix D for further details on message and data review expectations. Once the practice has 5 or more immunizations administered at the practice, alert the onboarding team requesting data quality analysis. MDHHS-HL7@michigan.gov
•	Complete Onboarding roles and responsibilities document	Next, work with your technical vendor to complete the Onboarding roles and responsibilities document [MCIR Transfer: Provider Site Responsibilities]. Provide detailed information about your EHR/health IT system capabilities and your organization's immunization practices informing onboarding testing.
• 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 and training from the MCIR Education and Training Analyst.

Step 3: Production Approval and Go-Live

Objective: Initiate production data exchange

Step 3 involves establishing an interface with the MCIR 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
•	Using the same credentials to connect with the MCIR production environment	MCIR Site staff will be working with the MCIR Education and Training Analyst (ETA's) to coordinate their MCIR HL7 training and **go-live date** after the form is returned. **This site must continue using the same method of entry for submitting vaccines to MCIR until their HL7 go-live date.**

		The Processing ID in MSH-11.1 is set to the value of P (Production). No changes need to be made on your end. MCIR will process the messages in production on the go-live date.
•	Enable and monitor the production interface	Initiate the production interface between the EHR/health IT system and the MCIR. 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 MCIR ACK messages. ***MCIR data quality analyst will provide feedback on any issues that must be addressed prior to onboarding closeout.***
•	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.*** If there are significant issues identified at this step, an organization may be required to go back to Step 2b: Testing to address problems.
•	Confirm onboarding close	Work with MCIR 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	MCIR data quality analyst 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 MCIR 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 MCIR ACK messages.
Ongoing	Conduct ongoing interface maintenance	Maintain the interface by ensuring new codes are added as applicable.
Ongoing	Maintain quality data submission	Use MCIR 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 immunization record 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 register in HSTR [Home Page - HSTR (michiganhealthit.org)] and reach out to the appropriate MCIR analyst at [MDHHS-MCIRQueryHelp@michigan.gov] to obtain approval and discuss next steps.

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.**

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

Contact the Data quality team at [MDHHS-HL7@michigan.gov] if any of these situations apply. MCIR 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, may be required when there is a change in any of the following:

- EHR/health IT system
- Message format
- Transport

Complete an Onboarding Registration form [Home Page - HSTR (michiganhealthit.org)] 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 MCIR team, 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 MCIR onboarding process

Stakeholder	Responsibilities during onboarding	Responsibilities post onboarding (ongoing monitoring)
MCIR and immunization program staff	• Provide general coordination/project management, communication, and customer service.	• Provide training on effective use of the MCIR. • Communicate ongoing expectations regarding

	• 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.	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.
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	• Verify initial setup is correct and data from the EHR is successfully populating the production MCIR. • Monitor ACK interface and appropriate EHR/MCIR reports to identify changes in volume or quality of messages or anything else that raises red flags about the interface.

	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. • Work with EHR vendor or organizational technical staff to resolve issues with the interface or submitted messages.	• Immediately report issues to the Data Quality Team, respective MCIR Education and Training team 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. • Communicate with MCIR 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 and we will document it on the roles and responsibility form. • Notify MCIR 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.	• 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.

	• Work with MCIR to identify, troubleshoot, and quickly resolve any issues with the interface or submitted messages. • Help MCIR manage expectations about process, milestones, and timelines with the provider organization. • Assist provider organizations with proper configuration of their EHR.	• 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 MCIR) of any changes or outages that may impact existing interfaces.
HIE	• Provide support for connectivity testing and troubleshooting (staffing and infrastructure). • Provide project management and technical expertise on behalf of the HIE team. • Be an active participant in the onboarding process and attend meetings/conference calls when appropriate. • Ensure that the HIE aligns with HL7 transport and messaging standards. • Ensure all MCIR ACKs are returned to provider organization/EHR. • Work with the MCIR and/or EHR vendor/provider organization to identify, troubleshoot, and quickly resolve any issues with the	• Assist provider organizations with proper configuration of their connection. • Provide continued support for monitoring and maintaining connectivity. • Provide technical support to resolve any connectivity issues. • Ensure all MCIR ACKs are returned to sender/provider organization. • Communicate with MCIR about any system changes/updates or outages that may impact existing interfaces. • Provide the MCIR with updated contact information for staff changes.

	interface or submitted messages. • Help MCIR manage expectations about process, milestones, and timelines with the provider organization. • Assist EHR vendor/provider organization with proper configuration of the EHR.	

Appendix B. MCIR Onboarding Checklist

Table 9. Provider organization MCIR onboarding checklist

Step/Activity	Resources	Status
Step 1: Discovery and Planning		
Step 1a: Readiness		
Enroll in MCIR		
Ensure technical capabilities to support immunization data exchange		
Complete the Onboarding Registration in HSTR		
Prepare for onboarding and data exchange with MCIR		
Step 1b: Kickoff		
Prepare for onboarding and data exchange with the MCIR		
Step 2: Development and Testing		
Step 2a: Connectivity		
Implement credentials to connect with the MCIR testing environment		
Troubleshoot to resolve issues as needed		
Step 2b: Testing		
Submit production messages to the MCIR testing environment for message and data review		
Complete the Onboarding Roles and Responsibilities document		
Step 3: Production Approval and Go-Live		
Participate in a "Go Live Training" call with your respective MCIR Education and Training Analyst		
Enable and monitor the production interface		
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[2]

MSA-1 Value	Description	National IG Description	ERR segment(s) and ERR-4 severity	Understanding of MCIR 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 MCIR 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: • 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.*

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

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

Appendix D. Message and Data Review

Organizations are expected to submit messages with no 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, MCIR 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 MCIR 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

Data review

Validity and accuracy

- Vaccines administered by the organization are represented in the data received by the MCIR.
- Administered vaccinations have active and specific CVX/NDC codes (not "unspecified" 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 MCIR.
- Submission reflects appropriate proportion of 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