



Scenarios for Updates and Queries

Executive Summary

Conformance expectations are provided for systems interfacing with immunization information systems (IIS) via VXU and/or QBP messaging.

- Systems submitting VXU messages to IIS SHALL follow expectations as indicated for VXU message creation for submission to IIS. For example, when immunization(s) are administered during an encounter, submitting systems SHALL trigger a VXU with one vaccination if reporting each vaccination individually or SHALL trigger a VXU with all vaccines given during the encounter if reporting the entire encounter at once.
- Systems sending QBP messages to IIS SHALL follow expectations as indicated for QBP message creation for querying IIS.

Background

The [National IG](#) indicates that the trigger for a system to create and send a VXU message to another system “may be an update or new record in the sending system” or may be “some other event.” Similarly, the description of the precondition for triggering the creation and sending of a QBP from one system to another is vague, indicating a QBP is initiated by “a user or other actor” requesting that the system send a query request.

Since the publication of the National IG, the IIS and electronic health record (EHR) community have widely adopted a common understanding of what situations require VXU and QBP messages to be created and sent. This document aims to document these scenarios and conformance expectations.

Scope

In scope

User and system actions to initiate the process of creating VXU and QBP messages to be sent to IIS—i.e., scenarios for systems to trigger VXU and QBP message creation for submission/sending to an IIS.

Out of scope

- IIS enrollment and/or onboarding processes, which establish authorization and access for HL7-based exchange with IIS
- Processes to queue and transmit VXU and QBP messages
- IIS processing and acknowledgment of/response to VXU and QBP messages

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Clarifications and Conformance Expectations

Conformance expectations for systems that submit VXU messages are outlined in the section on submitting systems, and conformance expectations for systems that send QBP messages are outlined in the querying systems section.

Submitting systems

Submission/acknowledgment messaging supports the submission of immunization information to IIS. Systems supporting submission/acknowledgment messaging with IIS SHALL follow conformance expectations for triggering VXU messages to be sent to an IIS per Table 1. These scenarios describe events in the submitting system, with corresponding conformance expectations.

Table 1. Submitting system conformance for triggering VXU messages

Scenario	Conformance Expectation
<i>New vaccination event/encounter occurred</i>	
Vaccination event(s) recorded in the medical record, with immunization(s) administered during an encounter.	SHALL support one but SHALL NOT support both: <ul style="list-style-type: none">• SHALL trigger a VXU with one vaccination if reporting each vaccination individually.• SHALL trigger a VXU with all vaccines given during an encounter if reporting entire vaccination encounter.
Evidence of immunity is recorded.	MAY trigger a VXU message. MAY be sent in a VXU message with other vaccination information. SHALL coordinate with IIS to confirm IIS support.
Adverse reaction is recorded.	MAY trigger a VXU message. MAY be sent in a VXU message with other vaccination information. SHALL coordinate with IIS to confirm IIS support.
Contraindication is recorded.	MAY trigger a VXU message. MAY be sent in a VXU message with other vaccination information. SHALL coordinate with IIS to confirm IIS support.
Refusal or exemption is recorded.	MAY trigger a VXU message. MAY be sent in a VXU message with other vaccination information. SHALL coordinate with IIS to confirm IIS support.



Scenario	Conformance Expectation
<i>Vaccination is anticipated to be administered in the future</i>	
Patient is anticipated to receive a vaccination—e.g., an order for vaccination is recorded.	SHALL NOT trigger a VXU.
<i>Historical vaccination given elsewhere recorded</i>	
Vaccination is transcribed from a historical record.	SHOULD trigger a VXU.
<i>Previously submitted vaccination event is modified</i>	
Vaccination record is modified with changes to one or more identifying vaccination record fields .*	SHALL trigger a VXU delete (where RXA-21 is D), followed by a VXU add (where RXA-21 is A) with the updated information.
Vaccination record is modified with changes to only non-identifying vaccination record fields .*	SHALL trigger a VXU update (where RXA-21 is U) with the updated information.
Vaccination record is viewed/opened without changes to identifying or non-identifying vaccination record fields .	SHALL NOT trigger a VXU.
Vaccination record is deleted.	SHALL trigger a VXU delete with same information that was sent in the previous add or update, except RXA-21 shall be D.
Vaccination record not originally reported by the submitting organization is deleted.	SHALL NOT trigger a VXU. SHALL contact IIS directly to request record cleanup.
<i>Patient demographic record is created/modified</i>	
New patient record is created.	MAY trigger a VXU. SHALL coordinate with IIS on acceptance and processing of VXUs with no immunization information.
Existing patient demographic record is modified.	MAY trigger a VXU. SHALL coordinate with IIS on acceptance and processing of VXUs with no immunization information.
Legal name is recorded for the first time for a newborn.	SHALL trigger a VXU containing patient's complete vaccination history.
Legal name is modified.	MAY trigger a VXU. SHALL coordinate with IIS on acceptance and processing of VXUs with no immunization information.
<i>Qualifying event occurred</i>	
System is submitting immunization information to the IIS for the first time.	MAY trigger a VXU containing patient's complete vaccination history. SHALL coordinate

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Scenario	Conformance Expectation
	with IIS when submitting system information for the first time.

*See [Appendix. Identifying Vaccination Record Fields](#)

Querying systems

Query/response messaging supports the retrieval of vaccination history and recommendations from IIS. Systems supporting query/response messaging with IIS SHALL follow conformance expectations for triggering QBP messages to be sent to an IIS per Table 2. The scenarios describe events in the querying system, with corresponding conformance expectations.

Table 2. Querying system conformance for triggering QBP messages

Scenario	Expected Conformance
<i>User-initiated</i>	
User requests patient immunization record.	SHALL trigger a QBP. SHALL allow user to initiate a manual query to the IIS for a single selected patient record as often as requested.
User requests patient immunization record after reporting immunization information to the IIS.	MAY trigger a QBP after reporting vaccinations to the IIS.
Patient/guardian requests immunization record as part of patient portal/consumer access.	SHALL trigger a QBP. SHALL allow patient/guardian to query for a patient record a limited number of times per day. SHALL coordinate with IIS to define this limit. SHALL have controls to prevent over-querying. SHOULD allow for re-query after too many matches found or no matches found.
<i>System-initiated</i>	
System-initiated query, either per patient or bulk patients.	SHALL allow system to query for a patient record a limited number of times per day. SHALL coordinate with IIS to define this limit. SHALL have controls to prevent over-querying.
<i>System-initiated, per patient</i>	
Patient schedules appointment.	MAY trigger a QBP.
Patient has appointment soon, either same day or next day.	MAY trigger a QBP.



Scenario	Expected Conformance
Patient encounter begins.	MAY trigger a QBP.
Patient encounter is complete.	MAY trigger a QBP.
<i>System-initiated, bulk patients</i>	
Query for all patients in sending system.	MAY trigger a series of single queries to request and retrieve all patient records. SHALL coordinate with IIS before querying.
Query for a limited cohort of patients in sending system.	MAY trigger a series of single queries to request and retrieve a set of patient records. SHALL coordinate with IIS before querying.



Appendix. Identifying Vaccination Record Fields

IIS rely on certain identifying fields to uniquely identify the vaccination event and support deduplication processes. Per the conformance expectations in Table 1, if the vaccination record is modified with changes to:

- *Identifying field(s)*, submitting systems SHALL trigger a VXU delete (where RXA-21 is D), followed by a VXU add (where RXA-21 is A) with the updated information
- *Only non-identifying field(s)*, submitting systems SHALL trigger a VXU update (where RXA-21 is U) with the updated information

Identifying fields are listed in Table 3, and non-identifying fields are listed in Table 4.

Table 3. Identifying vaccination record fields in HL7 VXU messages

Vaccination Record Fields	HL7 Location
Date of administration	RXA-3
Admin code	RXA-5
Vaccination event record type (administered/historical)	RXA-9
Administered at location	RXA-11.4

Table 4. Non-identifying vaccination record fields in HL7 VXU messages

Vaccination Record Fields	HL7 Location
Vaccine dose volume	RXA-6
Vaccine lot number	RXA-15
Vaccine expiration date	RXA-16
Vaccine manufacturer name	RXA-17
Vaccine route of administration	RXR-1
Vaccine site of administration	RXR-2
Vaccine information statement	OBX (LOINC 69764-9 in OBX-3)
Vaccine information statement given date	OBX (LOINC 29769-7 in OBX-3)
Vaccine funding source	OBX (LOINC 30963-3 in OBX-3)
Dose level eligibility	OBX (LOINC 64994-7 in OBX-3)

For further insights on Technical Advisory Bulletins, please refer to [TAB Overview](#)