# Query by Parameter (QBP) HL7, 2.5.1

# Onboarding and Implementation Guide

# For the MCIR HL7 Web Service

## Table of Contents

# Quality Assurance On-Boarding Steps for Provider Sites

Any provider site interested in sending bi-directional messages (QBP) must first be able to send VXU messages through their EHR and should already have a Roles and Responsibilities form on file.

1. **EHR Version 2.5.1**: Before on-onboarding, verify that your certified EHR is using HL7 version 2.5.1 and that they are able to capture the required fields that are outlined in this document.
2. **Message Transport**: Initial testing will be performed through e-mail with Sallie Sims (simss7@michigan.gov). Using this guide, provider sites will format QBP messages with their own patient test data and send them to Sallie for review and verification. The patient test data must be in MCIR or the query response will come back as NF (not found). If the message is correctly formatted, Sallie will send it on through the Data Hub for the response. If it is not, she will request that edits be made to the message. Once the response is received she will send it back to the provider site for data quality verification. (Sample messages can be found on the next page).
3. **Message Format Validation**: Once the correct formatting has been achieved, provider sites should begin testing through their Sub State Health Information Exchange.
   - During the testing phase, MSH-4 must contain the facility id provided (1255-60-20) and MSH-10 must contain a T to identify the message as a test.
4. **Contact Validation**: Once both the provider site and QO feel confident with their QBP test messages, they can contact Sallie to Go-Live.
   - Sallie will need to conduct data quality analysis and verify the content of the messages against MCIR. It is important to verify that all data is included in the response message and that it matches the provider site's data.
   - Go-To Meeting will be available for real time assistance.
   - MCIR staff will activate the site for QBP production in MCIR database

**All Questions and Initial Tests** should be sent to Sallie Sims (simss7@michigan.gov)

# QBP Sample Test Messages

### 1. Complete Patient Record and History

MSH|^~\&|EXPRESSMED1.1|1234-56-78|MCIR|MDCH|20120706131542-0400||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL|||||Z44^CDCPHINVS|MYHEALTHSYSTEM|MYCLINIC

QPD|Z44^REQUESTEVALUATEDHISTORYAND FORECAST^CDCPHINVS|QT216987|16300592300^^^MIA^SR|HOYLE^THERESE^ANNE^^^^L|HOYLE^THERESE^^^^^A|19590126|F|8400KELLERROAD^^DELTON^MI^49046^USA^L|^PRN^^^^269^6232071|Y|1|20120706121736-0400|LOCALEMRID

RCP|I|1RD|R

### 2. Opt Out Record

MSH|^~\&|EXPRESSMED1.1|1234-56-78|MCIR|MDCH|20120706131542-0400||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL|||||Z44^CDCPHINVS|MYHEALTHSYSTEM|MYCLINIC

QPD|Z44^REQUESTEVALUATEDHISTORYAND FORECAST^CDCPHINVS|QT216987|36741113415^^^MIA^SR|MICHIGANDER^OPTOUT^ANNE^^^^L|MICHIGANDER^MOM^^^^^A|20090909|F|245COMANO PL^^LANSING^MI^48922^USA^L|^PRN^^^^269^6232071|Y|1|20120706121736-0400|LOCALEMRID

RCP|I|1RD|R

### 3. Death Record

MSH|^~\&|EXPRESSMED1.1|1234-56-78|MCIR|MDCH|20120706131542-0400||QBP^Q11^QBP_Q11|48077894|T|2.5.1|||NE|AL|||||Z44^CDCPHINVS|MYHEALTHSYSTEM|MYCLINIC

QPD|Z44^REQUESTEVALUATEDHISTORYAND FORECAST^CDCPHINVS|QT216987|46288471075^^^MIA^SR|MICHIGANDER^LITTLE^^^^^L|MICHIGANDER^MOM^^^^^A|19940920|F|245COMANO PL^^LANSING^MI^48922^USA^L|^PRN^^^^269^6232071|Y|1|20120706121736-0400|LOCALEMRID

RCP|I|1RD|R

**QBP Message**:

MSH|^~\&|EPIC|16152306|MCIR|MDCH|20160901073941|15820|QBP^Q11|74043|P|2.5.1|
|||||||||Z44^CDCPHINVS| MYHEALTHSYSTEM|MYCLINIC

QPD|Z44^Requestevaluatedhistoryandforecast^HL70471|24781244|87654321^^^SHCPI^CPI|
Pebble^Stone^^^^^||19580424|M|2000RockQuarryRoad^^Lansing^MI^48933^USA^L|^PRN^
^^^517^5552000|Y|1|20160901073941-0400|LOCALEMRID
RCP|I|1RD|R

**RSP**:

MSH|^~\&|MCIR|MDCH|EPIC||20160901073949.989-
0400||RSP^K11^RSP_K11|20160901073949.977|P|2.5.1|||||||||Z42^CDCPHINVS|
MSA|AA|74043|Confirmation: E17F6C668CCF9A8F1FE423191A0AD5C2-1472729989966
QAK|24781244|OK
QPD|Z42^Requestevaluatedhistoryandforecast^HL70471|24781244|87654321^^^SHCPI^PRN|
Pebble^Stone^^^^^||19580424|M|2000RockQuarryRoad^^Lansing^MI^48933^USA

PID|1|12345678910^^^MIA|12345678910^^^MIA~12345678^^^MIA||||19580424|M|||||||
|||||||||||||||||||20150928
ORC|RE||9999
RXA|0|1|20150925|20150925|998^No Vaccine Administered^CVX|999|||||||||||||||NA
OBX|1|CE|30979-9^Vaccine Due Next^LN|1|139^Td (adult) inact-
NOS^CVX||||||F|||20150925
OBX|2|CE|59779-9^Vaccine Schedule Used^LN|1|CDCPHINVS||||||F|||20150925
OBX|3|TS|30980-7^Date Vaccine Due^LN|1|20141217||||||F|||20150925
OBX|4|TS|30981-5^Earliest Date to Give^LN|1|20141217||||||F|||20150925
OBX|5|NM|30973-2^Vaccine Due Next Dose Number^LN|1|2||||||F|||20150925
OBX|6|NM|59782-3^Number of Doses in Primary Series^LN|1|0||||||F|||20150925
OBX|7|CE|59783-1^Status in immunization
series^LN|1|^Overdue^eval_result_id||||||F|||20150925
ORC|RE||9999
RXA|0|1|20150925|20150925|998^No Vaccine Administered^CVX|999|||||||||||||||NA
OBX|8|CE|30979-9^Vaccine Due Next^LN|2|03^MMR^CVX||||||F|||20150925
OBX|9|CE|59779-9^Vaccine Schedule Used^LN|2|CDCPHINVS||||||F|||20150925
OBX|10|TS|30980-7^Date Vaccine Due^LN|2|19511102||||||F|||20150925
OBX|11|TS|30981-5^Earliest Date to Give^LN|2|19511102||||||F|||20150925
OBX|12|CE|59783-1^Status in immunization
series^LN|2|^Overdue^eval_result_id||||||F|||20150925
ORC|RE||9999

# Required Fields

| Symbol | Definition | Implementation Requirement | Operation Requirement |
|---|---|---|---|
| R | Required | The application **SHALL** implement "R" elements. | The application **SHALL** populate "R" elements with a non-empty value. |
| RE | Required but may be empty | The application **SHALL** implement "RE" elements. | The application **SHALL** populate "RE" elements with a non-empty value if there is relevant data. The term "relevant" has a confounding interpretation in this definition. |
| X | Not supported in this guide | The application (or as configured) **SHALL NOT** implement "X" elements. | The application **SHALL NOT** populate "X" elements. |
| O | Optional | None. The usage indicator for this element has not yet been defined. For an implementation profile all optional elements must be profiled to R, RE, C(a/b), or X. | Not Applicable. |

# Message Header Fields (MSH)

| SEQ | LEN | Data Type | Element Name | HL7 Usage | MCIR Usage | Description/Constraint |
|-----|-----|-----------|--------------|-----------|------------|------------------------|
| 1 | 1 | ST | Field Separator | R | R | The MSH-1 field shall be \| |
| 2 | 4 | ST | Encoding Characters | R | R | The MSH-2 field shall be ^~\& |
| 3 | | HD | Sending Application | RE | R | The system that created this message |
| 4 | | HD | Sending Facility Pin | RE | R | The Immunization History Consumer |
| 5 | | HD | Receiving Application | RE | R | The system receiving this message |
| 6 | | HD | Receiving Facility | RE | R | The Immunization History Consumer or the Immunization History Supplier, depending on the message |
| 7 | 26 | TS | Date/Time Of Message | R | R | The degree of precision must be at least to the second; time zone to be included |
| 8 | 40 | ST | Security | O | X | |
| 9 | 15 | MSG | Message Type | R | R | QBP^Q11^QBP_Q11 |
| 10 | 20 | ST | Message Control ID | R | R | Unique to each query |
| 11 | 3 | PT | Processing ID | R | R | T or P (test or production) |
| 12 | | VID | Version ID | R | R | 2.5.1 |
| 13 | 15 | NM | Sequence Number | O | X | |
| 14 | 180 | ST | Continuation Pointer | O | X | |
| 15 | 2 | ID | Accept Acknowledgement Type | R | R | Default value is NE(never) |
| 16 | 2 | ID | Application Acknowledgment Type | R | R | Default value is AL (always) |
| 17 | 3 | ID | Country Code | X | X | Blank |
| 18 | 16 | ID | Character Set | X | X | Blank |
| 19 | | CE | Principal Language Of Message | X | X | Blank |
| 20 | 20 | ID | Alternate Character Set Handling Scheme | X | X | Blank |
| 21 | | EI | Message Profile Identifier | R | R | Z34^CDCPHINVS |

| 22 | | XON | Sending Responsible Organization | RE | RE | Business organization that originated and is accountable for the content of the    message |
|---|---|---|---|---|---|---|
| 23 | | XON | Receiving Responsible Organization | RE | RE | Business organization that is the intended receiver of the message and is accountable for acting on the data |

# MSH Field Definitions

## *MSH-1 Field Separator (ST) 00001*

**Definition:** This field contains the separator between the segment ID and the first real field, MSH-2-encoding characters. As such it serves as the separator and defines the character to be used as a separator for the rest of the message. Required value is |.

**Example:** MSH|

## *MSH-2 Encoding Characters (ST) 00002*

**Definition:** This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. Required values are: **^~\&**.

Special characters that are utilized within HL7 messages as separators (also referred to as delimiters) should not be included within those same HL7 messages as data because their presence would interfere with the parsing of the message. If an HL7 message does contain one of these special delimiter characters as part of the message content (e.g., an ampersand as part of an address: "Apartment A & B"), then the HL7 data exchange partner must utilize a special escape sequence to indicate that the character is a text character and not a delimiter; otherwise, the CIR HL7 Web Service cannot distinguish between the delimiter character and a character that is part of the text.

In order to include any one of these special characters as data within an HL7 message, those characters must be converted into a predefined sequence of characters that begin and end with the escape character "\". HL7 Data Exchange Partners should utilize the table below to convert special characters into escape sequences when creating outbound messages to the CIR HL7 Web Service and to convert escape sequences to special characters when parsing inbound messages from the CIR HL7 Web Service: SEE BELOW

| Special Character Description | Special Character | Escape Sequence |
|---|---|---|
| Escape character | \ | \E\ |
| Field separator | \| | \F\ |
| Repetition separator | ~ | \R\ |
| Component separator | ^ | \S\ |
| Subcomponent separator | & | \T\ |

In the example below, in the QPD-8 address field when representing "Apartment A&B", the "&" has been replaced with the escape sequence "\T\" to indicate that "&" is part of the message text, rather than a subcomponent separator:

**QPD**|Z44^REQUESTIMMUNIZATIONHISTORY^HL70471|QT216987|16300592300^^
^MIA^SR|HOYLE^THERESE^ANNE^^^^L|HOYLE^THERESE^^^^^A|19590126|F|100
Main Street&Main Street&100^ **Apartment A\T\B** ^LANSING^MI^12345-1234^^P|

## *MSH-3 Sending Application (HD) 00003*

**Definition:** This field uniquely identifies the sending application.

**Example:** MSH|^~\&|**EXPRESSMED1.1**

## *MSH-4 Sending Facility (HD) 00004*

**Definition:** This field identifies the organization responsible for the operations of the sending application. This code will be assigned in MCIR.

## *MSH-5 Receiving Application (HD) 00005*

**Definition:** This field uniquely identifies the receiving application (IIS).

**Example: MCIR**

## *MSH-6 Receiving Facility (HD) 00006*

**Definition:** This field identifies the organization responsible for the operations of the receiving application.

**Example: MDCH**

## *MSH-7 Date/Time of Message (TS) 00007*

**Definition:** This field contains the date/time that the sending system created the message. The degree of precision must be at least to the minute. The expected format is YYYYMMDDHHMMSS-ZZZZ. Additional precision, if sent, will be ignored. If the Date Time of Message is not sent or is invalid (i.e., not a valid date or not in the correct format), a fatal error will be reported.

**Example:** |**20140204030159-0500**|

The above represents February 4, 2014 at 3:01:59 Eastern Standard Time (EST).

### MSH-9 Message Type (MSG) 00009

**Definition:** This field contains the message type, trigger event, and the message structure ID for the message.

**Example: QBP^Q11^QBP_Q11**

### MSH-10 Message Control ID (ST) 00010

**Definition:** This field contains the identifier assigned by the sending application (MSH-3) that uniquely identifies a message instance. This identifier is unique within the scope of the sending facility (MSH-4), sending application (MSH-3), and the YYYYMMDD portion of message date (MSH-7). The receiving system   echoes this ID back to the sending system in the Message acknowledgment segment (MSA). The content and format of the data sent in this field is the responsibility of the sender. The receiver returns exactly what was sent in response messages.

### MSH-11 Processing ID (PT) 00011

**Definition:** This field is used to decide whether to process the message as defined in HL7 Application (level 7) Processing rules. Use "P" for Production and "T" for Testing, all other values will be considered a fatal error. Also, if "P" is sent for a Test message or "T" is sent for a Production message, it will be considered a fatal error.

### MSH-12 Version ID (VID) 00012

**Definition:** This field contains the identifier of the version of the HL7 messaging standard used in constructing, interpreting, and validating the message. Only the first component need be populated. When sending a 2.5.1 message, value MSH-12 with "2.5.1".

### MSH-15 Accept Acknowledgment Type (ID) 00015

**Definition:** This field identifies the conditions under which accept acknowledgments are required to be returned in response to this message. Per the CDC IG, this field is constrained to a value of "NE" (never). If MSH-15 is blank or contains a value other than "NE" (never) type, MSH-15 will be treated as if "NE" was sent and no error will be reported.

### MSH-16 Application Acknowledgment Type (ID) 00016

**Definition:** This field contains the conditions under which application acknowledgments are required to be returned in response to this message. If MSH-16 is blank or contains a value other than "AL" (always) type, MSH-16 will be treated as if "AL" was sent and no error will be reported.

### MSH-21 Message Profile Identifier (EI) 01598

**Definition:** Sites may use this field to assert adherence to, or reference, a message profile.

### MSH-22 Sending Responsible Organization (XON)

**Definition:** Business organization that originated and is accountable for the content of the message - Health system or HIE submitting data on behalf of a clinic

### MSH-23 Receiving Responsible Organization (XON)

**Definition:** Business organization that is the intended receiver of the message and is accountable for acting on the data conveyed by the transaction - The actual clinic or hospital

# Query Parameter Definition Fields (QPD)

| SEQ | LEN | Data Type | Element Name | HL7 Usage | MCIR Usage | Description/Constraint |
|-----|-----|-----------|--------------|-----------|------------|------------------------|
| 1 | | CE | Message Query Name | R | R | Z44^Request Immunization History^HL70471 |
| 2 | 32 | ST | Query Tag | R | R | OT's # |
| 3 | | CX | Patient List | RE | R | PID-3: Patient Identifier List |
| 4 | | XPN | Patient Name | RE | R | PID-5: Patient Name |
| 5 | | XPN | Patient Mother Maiden Name | RE | RE | PID-6: Mother's Maiden Name |
| 6 | 26 | TS | Patient Date of Birth | RE | R | PID-7: Patient Date of Birth |
| 7 | 1 | IS | Patient Sex | RE | R | PID-8: Patient Sex |
| 8 | | XAD | Patient Address | RE | RE | PID-11: Patient Address |
| 9 | | XTN | Patient Home Phone | RE | RE | PID-13: Patient Home Phone |
| 10 | 1 | ID | Patient Multiple Birth Indicator | RE | RE | PID-24: Patient Multiple Birth Indicator |
| 11 | 2 | NM | Patient Birth Order | RE | RE | PID-25: Patient Birth Order |
| 12 | | TS | Client Last Updated Date | RE | X | PID-33:Patient Last Update Date |
| 13 | | HD | Client Last Update Facility | RE | X | PID-34: Patient Last Update Facility |

# QPD Field Usage Notes

## *QPD-1 Message Query Name (CE)*

**Definition:** This field contains the name of the query.

If QPD-1 is not valued or contains a value other than the expected value, the CIR HL7 Web Service will send a non-fatal error and will try to parse the query as if it conforms to the Z34 profile.

**Example:** The only acceptable value is **"Z44^Request Evaluated History and Forecast^HL70471"**

## *QPD-2 Query Tag (ST)*

**Definition:** This field must be valued by the HL7 Data Partner's system to identify the query and may be used to match response messages to the originating query.

## *QPD-3 Patient List (CX)*

**Definition:** This field contains identifiers that are intended to allow unique identification of the patient.

If multiple identifiers of the same type are sent (e.g., multiple Medicaid Numbers), only the first identifier of that type (e.g., the first Medicaid Number) will be processed. Other identifiers of that same type will be ignored

The Medical Record Number cannot exceed 15 characters. The Medicaid Number cannot exceed 8 characters. If the field limits are exceeded the identifier will be disregarded (not considered when seeking matching patients) and reported as a non-fatal error.

The Medicaid number must also be in the correct format (e.g., AA12345A). Invalid formatting of the Medicaid number will also cause the Medicaid number to be disregarded (not considered when seeking matching patients) and reported as a non-fatal error.

The Medicare number must have at least 10 characters and cannot exceed 15 characters.

The CIR HL7 Web Service does not support the full data set of identifiers; for example, Social Security Number (SSN) and Birth Registry Number (BR) are currently not supported and, if sent, will be reported as a non-fatal error and will not be included in the search criteria.

**Example:** 62000368^^^MR^MR

- LN – License Number
- LR – Local Registry ID
- MA – Patient Medicaid Number
- MC – Patient Medicare Number
- MR – Medical Record Number

HL7 Data Exchange Partners should also include, if available, the Birth Registry Number and State Registry ID in the Patient Identifier List. Although the CIR does not currently store these fields, it will eventually be modified to capture these fields and to utilize them to facilitate matching. The corresponding HL7 Identifier Type values are as follows:

- BRO - Birth Registry
- DR - State Registry ID

## QPD-4 Patient Name (XPN)

**Definition:** This field contains the patient's legal name.

Since this field should represent the patient's primary/legal name, if a name type of "L" is not provided, the name will still be considered the legal name when searching for matching patients and no error will be reported.

Both the Patient Last/Family Name and Patient First/Given Name are required. If either field is not valued the CIR HL7 Web Service will return a RSP with an "AR" in QAK-2 (Query Response Status) indicating that there was an error that prohibited the search for a matching patient.

The Patient Middle Name should be included, if available, but is not required.

The First Name, Last Name, and Middle Name must each be 25 characters or less; otherwise it will be truncated and reported as a non-fatal error. Only the first 25 characters will be used when searching for a matching patient.

Other QPD-4 components, (e.g., Last Name Prefix, Suffix, Prefix, and Degree), are not required and, if provided, will be ignored and not considered when searching for a matching patient.

**Example**: |LAST^ FIRST^MIDDLE^^^^L|

## QPD-5 Patient Mother Maiden Name (XPN)

**Definition:** This field contains the maiden name of the patient's mother.

If the name type is omitted or other than "M" (Maiden Name), the name will still be considered the mother's maiden name when searching for matching patients and no error will be reported.

Only the Last/Family Name is used when searching for matching patients.

Other QPD-5 components, (e.g., First/Given Name, Last Name Prefix, Suffix, Prefix, and Degree), are not required and, if provided, will be ignored and not considered when searching for a matching patient.

Example: |**MICHIGANDER^MOM^^^^^^M**|

## QPD-6 Patient Date of Birth (TS)

**Definition:** This field contains the patient's date of birth.

The date must be in the YYYYMMDD format and must be on or before the current date, otherwise it will be considered a fatal error. The time component of the data will be ignored if it is provided.

If QPD-6 does not contain a valid date the CIR HL7 Web Service will return a RSP with an "AR" in QAK-2 (Query Response Status) indicating that there was an error that prohibited the search for a matching patient.

## QPD-7 Patient Sex (IS)

**Definition:** This field contains the patient's sex.

In a QBP message, CIR supports all of the Administrative Sex codes (F, M, and U). If QPD-7 is valued with "U," sex will not be considered when searching for a matching patient.

## QPD-8 Patient Address (XAD)

**Definition:** This field contains the patient's primary address.

If any QPD-8 component is valued then all of the following components must be valued: Street Address, City, State, and Zip; otherwise, address will not be included in the patient search and a non-fatal error will be reported for each omitted component.

QPD-8 should be valued as follows:

- Street or Mailing Address should contain the house (dwelling) number in the beginning of the field followed by the street name. If the value exceeds 40 characters it will be truncated.

    - If address is valued, then street name and dwelling should also be valued but is not required; however, valuing these components (especially the House/Dwelling Number) will aid in-patient searches.

- Other Designation should contain the apartment or suite number, if applicable. The apartment number cannot exceed 10 characters, otherwise it will be truncated.

- City cannot exceed 40 characters, otherwise it will be truncated.

- The State cannot exceed 2 characters; otherwise, the state will be set to "MI".

- ZIP Code cannot exceed 10 characters; otherwise it will be ignored. The MCIR HL7 Web Service supports the standard ZIP code formats of either ##### (5 digit ZIP only) or #####-#### (ZIP+4 including hyphen). If ZIP+4 is sent, the hyphen may be included but is not required.

  ***Example:***
  |305 Big Apple Blvd & Big Apple Blvd&305^7C^New York^NY^12345^^P|

The MCIR HL7 Web Service will process the first address; additional addresses, if sent, will be ignored.

Address Type will be ignored, if sent. The address included in the query will be compared to all addresses on record for the patient.

Errors, (e.g., character maximum exceeded, invalid state code, ZIP less than 5 digits, missing component, etc.) will be reported as non-fatal.


## QPD-9 Patient Home Phone (XTN)

**Definition:** This field contains the patient's home phone number.

**Example:|^PRN^^^^212^5551212|**

The MCIR HL7 Web Service will process the first phone number. All other phone numbers will be ignored.

The MCIR HL7 Web Service will process the 6th and 7th components (area code and local phone number) of the first phone number. If QPD-9 is valued then both the area code and local phone number must be valued; otherwise, the phone number will be disregarded and a non-fatal error will be reported for the omitted component.

Telecommunication Use Code will be ignored, if sent. The phone number included in the query will be compared to all phone numbers on record for the patient.

If QPD-9 contains errors, (e.g., area code is not 3 digits, phone number is not 7 digits, or area code is provided but the phone number is missing), those errors will be reported as non-fatal errors and the phone number will not be considered when searching for a matching patient.

### QPD-10 Multiple Birth Indicator (ID)

**Definition:** This field indicates whether the patient was part of a multiple birth. If the status is undetermined, then field should be empty.

The acceptable values are Y (if the patient was part of a multiple birth) and N (if the patient was a single birth); all other values will be disregarded (not considered when searching for a matching patient) and reported as a non-fatal error.

### QPD-11 Birth Order (NM)

**Definition:** For patients that were part of a multiple birth, this field indicates the birth order. If Multiple Birth Indicator (QPD-10) is populated with Y, then this field should contain the number indicating the person's birth order, with 1 for the first child born and 2 for the second.

Birth order is stored in the MCIR database and utilized in a patient search. If the HL7 Data Exchange Partner knows the birth order, the birth order should be sent in QPD-11 of the QBP. QPD-11 will be ignored if it is not valued or its value is not a number.

# Response Control Parameter Segment (RCP)

| SEQ | LEN | Data Type | Element Name | HL7 Usage | MCIR Usage | Description |
|-----|-----|-----------|--------------|-----------|------------|-------------|
| 1 | 1 | ID | Query Priority | RE | RE | If this field is not valued then it shall default to I. The only value permitted is I. |
| 2 | 10 | CQ | Quantity Limited Request | RE | | |
| | | NM | | | RE | The maximum number of patients that may be returned. This shall be valued as 1 (one). |
| | | CWE | | | RE | This value shall be RD (records). |
| 3 | 60 | CWE | Response Modality | O | RE | Default is R (Real-Time). |

# RCP Field Usage Notes

## RCP-1 Query Priority (ID)

**Definition:** This field contains the time frame that the response is expected. The MCIR HL7 Web Service will always respond immediately to a QPD request for immunization history. If RCP-1 is not valued or contains a value other than "I" (Immediate) the CIR HL7 Web Service will ignore the field and will process the message as if "I" was sent.

## RCP-2 Quantity Limited Request (CQ)

**Definition:** This field contains the maximum length of the response that can be accepted by the HL7 Data Exchange Partner. A numerical value is given in the first component and the units are specified in the second component.

The MCIR HL7 Web Service will never return more than one patient record in response to a QPD request for immunization history. If RCP-2 is not valued or contains a value other than "1" in and "RD" (records) the MCIR HL7 Web Service will ignore the field and will process the message as if "1RD" was sent.

## RCP-3 Response Modality (CE)

**Definition:** This field specifies the timing and grouping of the response message(s). The MCIR HL7 Web Service does not support batch processing; only real time messages are supported. If RCP-3 is not valued or contains a value other than "R" the MCIR HL7 Web Service will ignore the field and will process the message as if "R" was sent.

# RXA—Pharmacy/Treatment Administration Segment

The RXA segment carries pharmacy administration data. It is a child of an ORC segment, which a repeating segment in the RSP and because ORC are allowed to repeat, an unlimited numbers of vaccinations may be included in a message. Each RXA must be preceded by an ORC.[1]

*Table 0-1 Pharmacy/Treatment Administration (RXA) (Z42)*

| SEQ | LEN | Data Type | Cardinality | Value Set | Item # | Element Name | HL7 Usage | MCIR Usage |
|-----|-----|-----------|-------------|-----------|--------|--------------|-----------|------------|
| 1 | 4 | NM | [1..1] | | 00342 | Give Sub-ID Counter | R | R |
| 2 | 4 | NM | [1..1] | | 00344 | Administration Sub-ID Counter | R | R |
| 3 | | TS | [1..1] | | 00345 | Date/Time Start of Administration | R | R |
| 4 | | TS | [0..1] | | 00346 | Date/Time end of Administration | RE | X |
| 5 | | CE | [1..1] | 0292 | 00347 | Administration Code | R | R |
| 6 | 20 | NM | [1..1] | | 00348 | Administered Amount | R | R |
| 7 | | CE | [0..1] | | 00349 | Administered Units | CE | R |
| 8 | | CE | [0..1] | | 00350 | Administered Dosage Form | O | X |
| 9 | | CE | [0..*] | NIP 0001 | 00351 | Administration Notes | RE | RE |
| 10 | | XCN | [0..1] | | 00352 | Administering Provider | RE | RE |
| 11 | | LA2 | [0..1] | | 00353 | Administered at Location | RE | RE |
| 12 | 20 | ST | [0..1] | | 00354 | Administered Per (Time Unit) | O | X |
| 13 | 20 | NM | [0..1] | | 01134 | Administered Strength | O | X |
| 14 | | CE | [0..1] | | 01135 | Administered Strength Units | O | X |
| 15 | 20 | ST | [0..*] | | 01129 | Substance Lot Number | RE | RE |
| 16 | | TS | [0..1] | | 01130 | Substance Expiration Date | RE | RE |
| 17 | | CE | [0..*] | 0227 | 01131 | Substance Manufacturer Name | RE | RE |
| 18 | | CE | [0..*] | NIP 002 | 01136 | Substance/Treatment Refusal Reason | C | X |
| 19 | | CE | [0..1] | | 01123 | Indication | O | X |
| 20 | 2 | ID | [0..1] | 0322 | 01223 | Completion Status | RE | R |
| 21 | 2 | ID | [0..1] | 0323 | 01224 | Action Code – RXA | RE | RE |
| 22 | | TS | [0..1] | | 01225 | System Entry Date/Time | O | X |
| 23 | 5 | NM | [0..1] | | 01696 | Administered Drug Strength Volume | O | X |
| 24 | | CWE | [0..1] | | 01697 | Administered Drug Strength Volume Units | O | X |
| 25 | | CWE | [0..1] | | 01698 | Administered Barcode Identifier | O | X |
| 26 | 1 | ID | [0..1] | 0480 | 01699 | Pharmacy Order Type | O | X |

.

## RXA Field Definitions

### RXA-1 Give Sub-ID Counter (NM) 00342

Definition: This field is used to match an RXA and RXG. Not a function under IIS.

Constrain to 0 (zero).

### RXA-2 Administration Sub-ID Counter (NM) 00344

Definition: This field is used to track multiple RXA under an ORC. Since each ORC has only one RXA in immunization messages, constrain to 1. This should not be used for indicating dose number, which belongs in an OBX.

Note that the previous Implementation Guide suggested that this be used for indicating dose number. This use is no longer supported.

### RXA-3 Date/Time Start of Administration (TS) 00345

Definition: The date this vaccination occurred. In the case of refusal or deferral, this is the date that the refusal or deferral was recorded. In the case of a forecast dose, this is the date the forecast was made.

### RXA-4 Date/Time End of Administration (If Applies) (TS) 00346

Definition: In the context of immunization, this is equivalent to the Start date/time. If populated it should be = RXA-3. If empty, the date/time of *RXA-3-Date/Time Start of Administration* is assumed.

### RXA-5 Administered Code (CE) 00347

Definition: This field identifies the medical substance administered. If the substance administered is a vaccine, CVX codes should be used in the first triplet to code this field (see HL7 Table 0292 - Codes for vaccines administered). The second set of three components could be used to represent the same vaccine using a different coding system, such as Current Procedural Terminology (CPT). CVX code is the strongly preferred code system.

### RXA-6 Administered Amount (NM) 00348

Definition: This field records the amount of pharmaceutical administered. The units are expressed in the next field, RXA-7.    Registries that do not collect the administered amount should record the value "999" in this field.

### RXA-7 Administered units (CE) 00349

Definition: This field is conditional because it is required if the administered amount code does not imply units. This field must be in simple units that reflect the actual quantity of the substance administered. It does not include compound units. This field is not required if the previous field is populated with 999.

### RXA-9 Administration Notes (CE) 00351

Definition: This field is used to indicate whether this immunization record is based on a historical record or was given by the reporting provider. It should contain the information source (see *NIP-defined Table 0001 - Immunization Information Source)*. The first component shall contain the code, the second the free text and the third shall contain the name of the code system. (NIP001) Sending systems should be able to send this information. Receiving systems should be able to accept this information.

This field may be used for other notes if specified locally. The first repetition shall be the information source. If other notes are sent when information source is not populated, then the first repetition shall be empty.

Other notes may include text only in component 2 of the repeat. Acceptance of text only is by local agreement only.

Information source is an NVAC core data element. It speaks to the reliability of the immunization record. IIS rely on this information.

### RXA-10 Administering Provider (XCN) 00352

Definition: This field is intended to contain the name and provider ID of the person physically administering the pharmaceutical.

Note that previous Implementation Guide (2.3.1) overloaded this field by using local codes to indicate administering provider, ordering provider and recording provider. This is a misuse of this field and not supported in this Guide. The ordering and entering providers are indicated in the associated ORC segment.

### RXA-11 Administered-at Location (LA2) 00353

Definition: The name and address of the facility that administered the immunization. Note that the components used are:

Component 4: The facility name/identifier.

Subcomponent 1: Identifier[2]

Subcomponent 2: Universal ID this shall be an OID, if populated. Note that this should not be a local code, but rather a universal id code.

Subcomponent 3: Universal ID type (specify which universal id type)

Note that if subcomponent 1 is populated, 2 and 3 should be empty. If subcomponent 2 is populated with an OID, subcomponent 3 must be populated with ISO.

Component 9-15: Facility address.

Components not specifically mentioned here are not expected in immunization messages.

### RXA-15 Substance Lot Number (ST) 01129

Definition: This field contains the lot number of the medical substance administered. It may remain empty if the dose is from a historical record.

**Note:** The lot number is the number printed on the label attached to the container holding the substance and on the packaging which houses the container. If two lot numbers are associated with a product that is a combination of different components, they may be included in this field. The first repetition should be the vaccine.

### RXA-16 Substance Expiration Date (TS) 01130

Definition: This field contains the expiration date of the medical substance administered. It may remain empty if the dose is from a historical record.

**Note:** Vaccine expiration date does not always have a "day" component; therefore, such a date may be transmitted as YYYYMM.

### RXA-17 Substance Manufacturer Name (CE) 01131

Definition: This field contains the manufacturer of the medical substance administered.

**Note:** For vaccines, code system MVX should be used to code this field.

### RXA-18 Substance/Treatment Refusal Reason (CE) 01136

Definition: This field contains the reason the patient refused the medical substance/treatment. Any entry in the field indicates that the patient did not take the substance. If this field is populated RXA-20, Completion Status shall be populated with RE.

### RXA-20 Completion Status (ID) 01223

This field indicates if the dose was successfully given. It must be populated with RE if RXA-18 is populated with NA. If a dose was not completely administered or if the dose were not potent this field may be used to label the immunization. If this RXA has a CVX of 998 (no vaccine administered) then this shall be populated with NA.

### RXA-21 Action Code – RXA (ID) 01224

This field indicates the action expected by the sending system. It can facilitate update or deletion of immunization records. This field has a usage of RE. If it is left empty, then receiving systems should assume that the action code is A.

ORC-3, Placer order number, may be used to link to a specific immunization if the system receiving the request has recorded this from the initial order. Local implementers should specify its' use in a local implementation guide.

The action code U (Update system) is used to indicate to a subordinate receiver that a previously sent immunization should be changed. Most IIS have specific criteria for determining whether to

add or update an immunization that does not rely directly on this field. For this reason it is common practice to indicate action as Add even if this vaccination has been previously reported. It is important to not assume that Updates will be or need to be specifically indicated.

**RXA-22 System Entry Date/Time (TS) 01225**

This field records the date/time that this record was created in the originating system. Local implementations should specify its' use.

## OBX – Observation Segment

The OBX segment is also part of the Response Group. The Response Group will only be returned when a single matching patient is found.

In an RSP, the OBX segment carries observations associated with the RXA or immunization record. The basic format is a question (OBX-3) and an answer (OBX-5).

*Table 0-10 Observation Segment (OBX) in a RSP*

| SEQ | Data Type | Cardinality | Value Set | Element Name | HL7 Usage | MCIR Usage |
|---|---|---|---|---|---|---|
| 1 | SI | [1..1] | | Set ID – OBX | R | R |
| 2 | ID | [1..1] | 0125 | Value Type | R | R |
| 3 | CE | [1..1] | | Observation Identifier | R | R |
| 4 | ST | [1..1] | | Observation Sub-ID | RE | RE |
| 5 | VARIES | [1..1] | | Observation Value | R | R |
| 6 | CE | [0..1] | | Units | CE | X |
| 7 | ST | [0..1] | | References Range | O | X |
| 8 | IS | [0..1] | 0078 | Abnormal Flags | O | X |
| 9 | NM | [0..1] | | Probability | O | X |
| 10 | ID | [0..1] | 0080 | Nature of Abnormal Test | O | X |
| 11 | ID | [1..1] | 0085 | Observation Result Status | R | R |
| 12 | TS | [0..1] | | Effective Date of Reference Range Values | O | X |
| 13 | ST | [0..1] | | User Defined Access Checks | O | X |
| 14 | TS | [1..1] | | Date/Time of the Observation | R | R |
| 15 | CE | [0..1] | | Producer's Reference | O | X |
| 16 | XCN | [0..1] | | Responsible Observer | O | X |
| 17 | CE | [0..1] | | Observation Method | O | X |
| 18 | EI | [0..1] | | Equipment Instance Identifier | O | X |
| 19 | TS | [0..1] | | Date/Time of the Analysis | O | X |
| 20 | | [0..1] | | Reserved for Harmonization with V2.6 | O | X |
| 21 | | [0..1] | | Reserved for Harmonization with V2.6 | O | X |
| 22 | | [0..1] | | Reserved for Harmonization with V2.6 | O | X |
| 23 | XON | [0..1] | | Performing Organization Name | O | X |
| 24 | XAD | [0..1] | | Performing Organization Address | O | X |
| 25 | XCN | [0..1] | | Performing Organization Medical Director | O | X |

## OBX – Field Definitions

### OBX-1 Set ID - OBX (SI)

This field contains the sequence number.
For each OBX under an RXA, the CIR HL7 Web Service will value the first OBX with "1"; each subsequent OBX will be valued with the next number in sequence. The OBX Set ID numbering schema will restart at "1" for the next set of OBX segments (under the next RXA segment).

### OBX-2 Value Type (ID)

This field contains the format of the observation value in OBX. If the value is CE then the result must be a coded entry.

### OBX-3 Observation Identifier (CE)

This field contains a unique identifier for the observation. The format is that of the Coded Element (CE). Example: |**30980-7^Date vaccine due^LN**|.

OBX-3 may be thought of as a question that the observation (OBX-5) answers. In the example above, the question is "when is the next dose of this vaccine due (recommended)"? The answer in OBX-5 could be "20130714".

### OBX-4 Observation Sub-ID (ST)

This field is used to group related observations by setting the value to the same number.

Each related observation would share an Observation sub-id.

**For example:**
RXA|0|999|20120601|20120601|110^DTaP/HepB/IPV (Pediarix)^CVX|999|||||||||20050810-01|19201231|PD^Parkedale Pharmaceuticals (formerly Parke-Davis)^MVX|
OBX|1|CE|38890-0^Component Vaccine Type^LN|1|106^DTaP, 5 pertussis antigen^CVX||||||F|
OBX|2|CE|38890-0^Component Vaccine Type^LN|2|10^IPV^CVX||||||F|
OBX|3|CE|38890-0^Component Vaccine Type^LN|3|08^Hep B, adolescent or pediatric^CVX||||||F|
OBX|4|ID|59781-5^Dose Validity^LN|3|N||||||F|
OBX|5|CE|30982-3^Reason applied by forecast logic to project this vaccine^LN|3|1004^This immunization event occurred prior to the recommended age or recommended interval for this dose.^NYCDOHINVSHOTCODES||||||F|
OBX|6|CE|59779-9^Immunization Schedule used^LN|3|VXC16^ACIP^CDCPHINVS||||||F|
ORC|RE||Influenza|
RXA|0|1|||998^No vaccine administered^CVX|999|
OBX|1|CE|30979-9^Vaccine due next^LN|1|88^influenza, NOS^CVX||||||F|
OBX|2|DT|30980-7^Date vaccine due^LN|1|20120901||||||F|
OBX|3|CE|59779-9^Immunization Schedule used^LN|1|VXC16^ACIP Schedule^CDCPHINVS||||||F|

### OBX-5 Observation Value (varies)

This field contains the observation (answer) posed by the question in OBX-3 (Observation Identifier). OBX-2 (Value Type) contains the data type for this field.

### OBX-6 Units (CE) 00574

This shall be the units for the value in OBX-5. The value shall be from the ISO+ list of units.

### OBX-11 Observation Result Status (ID)

Value this field should be "F" (Final)

### OBX-14 Date/Time of the Observation (TS)

This field represents the time of the observation. It is the physiologically relevant date-time or the closest approximation to that date-time of the observation.

# HL7 Key Definitions

**Message:** A message is the entire unit of data transferred between systems in a single transmission. It is a series of segments in a sequence defined by the message specifications. These specifications are based on constraints to the HL7 specifications.

**Segment Group:** A segment group is a logical collection of segments. Segment groups defined within a message may be required or optional, may occur only once or may be allowed to repeat.

**Segment:** A segment is a logical grouping of data fields. Segments within a defined message may be required or optional, may occur only once, or may be allowed to repeat. Each segment is named and is identified by a segment ID, a unique 3-character code.

**Field:** A field is a string of characters and is of a specific data type. Each field is identified by the segment it is in and its position within the segment; e.g., MHS-5 is the fifth field of the MHS segment. A field is preceded by the | character.

**Component:** A component is one of a logical grouping of items that comprise the contents of a coded or composite field. Within a field having several components, not all components are required to be valued.

**Data type:** A data type restricts the contents and format of the data field. Data types are given a 2- or 3- letter code. Some data types are coded or composite types with several components.

**Code Sets/Systems and Value sets:** Most data elements will have associated lists of acceptable values in tables supported by a standards organization such as HL7 or CDC. These code sets will include definitions to support common usage.

**Delimiters:** Delimiter characters are used to separate segments, fields, and components in an HL7 message. The delimiter values are given in MSH-2 and used throughout the message. Applications must use agreed upon delimiters to parse the message.

<CR> = Segment Terminator;

| = Field Separator;

^ = Component Separator;

& = Sub-Component Separator;

~ = Repetition Separator;

\ = Escape Character.