IHS RPMS eLearning Training

Immunization Data Exchange BYIM v3.0

Dave Blaeser

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BYIM Immunization Data Exchange

Version 3.0

Introduction

This training will describe the functional changes implemented in BYIM v3.0 and discuss:

- The new bidirectional functionality

- The parameter to trigger the automatic request of a State History/Forecast

- The new immunization configuration parameters

- Additional troubleshooting options for HL7 message issues

This Course Is Suitable for the Following Roles

- Area Informaticists
- Immunization Data Exchange package administrators

Prerequisites

- Users should be familiar with the current BYIM Immunization Data Exchange process

Learning Objectives

By the end of this training you will be able to:

- Manage the automatic trigger of queries to the State Immunization Information Systems (SIIS)

- Manage new parameters that control state communications

- Use new menu options to send HL7 messages and evaluate responses

- Understand the difference between the following HL7 messages: Z44, Z42, Z33, Z22, Z23

- Understand the basic format of an HL7 message

Objective 1: Manage Query Triggers

A major addition to BYIM v3.0 is the ability to send and receive Evaluated History and Forecast information from the State Immunization Information Systems (SIIS) configured for your site. The information returned by your SIIS can be displayed by the EHR Immunization component (discussed in the **EHR p29 Immunizations Component** training presentation) or in the new **Immunization Queries** option (discussed later in this presentation).

This objective focuses on the how that the requests to the SIIS can be created. There are four methods:

- Real-time request via the **Refresh State** button in the EHR Immunization component
- Real-time request via the new **Immunization Queries** option
- Background job that runs in the morning that sends requests for all appointments scheduled for that day
- Trigger that sends a request when the patient is checked-in

Note that these methods are not mutually exclusive and any or all methods can be utilized.

Auto Query Mode Parameter

The Auto Query Mode parameter is set up using the **SET UP Immunization Data Exchange Parameters** option and has three possible values:

     1   SCH'D APPTS ONLY

     2   CHECK-IN ONLY

     3   SCH'D AND CHECK-IN

- SCH'D APPTS ONLY will check all appointments for the day and send requests for each patient that has a scheduled appointment to your SIIS. If scheduled, it will send the requests in the morning.

- CHECK-IN ONLY will send requests to your SIIS as each patient is checked in. This allows evaluated history and forecast requests for walk-in patients.

- SCH'D AND CHECK-IN will do both of the above.

```
Auto Query Mode...............: ?
    Choose from:
      1          SCH'D APPTS ONLY
      2          CHECK-IN ONLY
      3          SCH'D AND CHECK-IN
```

Objective 2: Manage Parameters

- Demonstrate the new configuration parameters introduced by BYIM v3.0.
  - Sending Organization information
  - Receiving Organization information
  - Purge setting
  - VIS Barcode/NOS Document Type

Responsible Sending Organization Parameter

Below are the parameters that can be entered for the Responsible Sending Organization, which consists of multiple components in the **MSH-22** field. The Responsible Sending Organization is defined as the "Business organization that originated and is accountable for the content of the message."

You will need to work with your specific State Immunization Information Systems (SIIS) to determine the appropriate values for the components of this field. The values for the components of this field can be entered in the **SET UP Immunization Data Exchange Parameters** option.

```
Sending Org Name       MSH-22.1: NISTEHRFAC//
Sending Org Auth       MSH-22.6: RPMS//
Sending Org Type Code  MSH-22.7: XX//
Sending Org ID         MSH-22.10: 100-6482//
```

Responsible Receiving Organization Parameter

Below are the parameters that can be entered for the Responsible Receiving Organization, which consists of multiple components in the **MSH-23** field. The Responsible Receiving Organization is defined as the "Business organization that is the intended receiver of the message and is accountable for acting on the data conveyed by the transaction."

You will need to work with your specific SIIS to determine the appropriate values for the components of this field. The values for the components of this field can be entered in the **SET UP Immunization Data Exchange Parameters** option.

```
Receiving Org Name     MSH-23.1: NISTIISFAC//
Receiving Org Auth     MSH-23.6: RPMS//
Receiving Org Type Cd MSH-23.7: XX//
Receiving Org ID       MSH-23.10: 100-3322//
```

Purge Parameter

As part of BYIM v3.0, a copy of all HL7 messages sent to and received from the SIIS are stored in RPMS for viewing and debugging. In order to manage disk space utilization, these messages are purged based on the number of days set in the **Purge HL7 Message after ? Days** parameter.

At installation, the software defaults this value to 90 days, but this can be changed at any time using the **SET UP Immunization Data Exchange Parameters** option. The range of values that can be entered is 90 to 999 days.

```
Purge HL7 Message after ? days: 90//
```

VIS Barcode/NOS Document Type Parameter

The latest standard is to send the Vaccine Information Statement (VIS) information in the OBX segments. However, some SIIS may still want to receive information related to the Not Otherwise Specified (NOS) Document Type in the OBX segments.

This parameter allows sites to indicate whether their respective SIIS wants a VIS information or an NOS Document Type information. Note that if the parameter is not set, the default will be **VIS BARCODE**.

```
Use VIS Barcode or NOS SEGS...: VIS BARCODE//
```

Objective 3: New Immunization Queries Option

- Demonstrate the new **Immunization Queries** option introduced by BYIM v3.0.

- This new option has the following functionality:
  - Send Patient Immunizations
  - Request Patient Imm History and Forecast
  - Send Scheduled Appt Queries
  - Review Query or VXU Sent
  - Review Query or VXU Response

Send Patient Immunizations

This option allows the user to send an **Unsolicited Vaccine Record Update (Z22-VXU)** message for one or more patients.

The option also allows user to send all vaccines for the patient or only the new, modified, or deleted vaccines that have not already been sent.

For each patient selected, a VXU message will be sent to each SIIS that is configured for the site.

See the example on the next slide.

Send Patient Immunizations (Example)

```
Which action: 2  Send Patient Immunizations

Which immunizations should be included:

     Select one of the following:

          1          NEW/EDITED Immunizations (not previously exported)
          2          ALL Immunizations for exported patient(s)

Send NEW or ALL Immunizations: NEW/EDITED Immunizations// 2  ALL Immunizations for exported patient(s)

Select patient(s) to send to the State Immunization Registry

Select patient: DEMO,PATIENT            F 01-01-2020 XXX-XX-5555   TST 500001

    1               DEMO,PATIENT

Select another patient:

An 'Unsolicited Vaccine Record Update (VXU)' will be sent for:

    1               DEMO,PATIENT

Do you want to proceed? YES//

Please stand by.  This may take a couple of seconds...


Immunization record for: DEMO,PATIENT
        being sent to: ARIZONA

Press <ENTER> to continue or '^' to exit...:
```

Request Patient Immunization History/Forecast

This option allows the user to send an Immunization History and Forecast request (Z44) for one or more patients.

For each patient selected, a request will be sent to each SIIS that is configured for the site. Within a few seconds, the response from the SIIS should be received and stored. The response can then be displayed either in the EHR Immunization component or in the **Review Query or VXU Response** functionality included in this option.

See the example on the next slide.

Request Patient Immunization History/Forecast (Example)

```
Select patient(s) to send to the State Immunization Registry

Select patient: DEMO,PATIENT              F 01-01-2020 XXX-XX-5555   TST 500001

     1              DEMO,PATIENT

Select another patient:

A 'Request for Evaluated Imm History and Forecast' will be sent for:

     1              DEMO,PATIENT

Do you want to proceed? YES//

Please stand by.  This may take a couple of seconds...

Query being sent for: DEMO,PATIENT

Query for : DEMO,PATIENT
     being sent to: ARIZONA
     QUERY Message ID: IHS-112427 for DEMO,PATIENT
     and can be used to look up the response from:
          ARIZONA

Press <ENTER> to continue or '^' to exit...:
```

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Send Scheduled Appt Queries

This option allows the user to send Immunization History and Forecast Query (Z44) request for every patient that has a scheduled appointment or check-in on the date selected by the user.

This will default to the value in the Auto Query Mode parameter, if it is set. Otherwise, the user can select **Schedule appointments only**, **Check-ins only**, and **Both scheduled appts and check-ins**.

See the example on the next slide.

Send Scheduled Appt Queries (Example)

```
Select a date for which to send queries for:

        Scheduled appointments only



    Date for Appointment Queries:  T


        Queries will be sent for all patients who have

        Scheduled appointments only on JUL 24,2020


Press <ENTER> to continue or '^' to exit...:
```

Review Query or VXU Sent

This option allows the user to review the message sent to the SIIS, whether an **Unsolicited Vaccine Record Update (VXU)** message or an **Immunization History and Forecast Query** request.

The user has the option to display only the Immunization Information or to display the complete HL7 message.

The next slide shows an example of the Immunization Information display and the slide that follows shows an example of the HL7 display.

Review Query or VXU Sent (Immunization Information)

```
Select Original Query or VXU sent

Select Patient, VXU Date or Message ID:    izrt_vxu_26880_3_20200716_223916.dat      PATIENT,DEMO     Jul 16,2020@22:39:16     IHS-112323     ARIZONA

        Select one of the following:

            1           Immunization Information Only
            2           HL7 Message Content

Which display option: Immunization Information Only//

HL7 message sent:               Date/State File Name/Message ID
----------------------------- ---------- -------------------------------------
PATIENT,DEMO  (F)             07/16/2020 izrt_vxu_26880_3_20200716_223916.da
DOB: 03/17/1995  HRN: 7120     ARIZONA    IHS-112323

Query or VXU (1094)
--------------------------------------------------------------------------------
PATIENT,DEMO                    03/17/1995 F HRN: 007120
----------------------------- ---------- - -----------
  CVX VACCINE ADM DATE AGE     LOCATION REACTION VOL SITE LOT   MAN VALID STATUS
- --- ------- -------- ------ -------- -------- --- --- ------ --- ----- ------
S 121 ZOS-Liv 20150317 20 yrs 2020 DEM          999                   CP

Press <ENTER> to continue or '^' to exit...:
```

Review Query or VXU Sent (HL7)

```
HL7 message sent:              Date/State File Name/Message ID
------------------------------ ---------- ------------------------------------
PATIENT,DEMO  (F)              07/16/2020 izrt_vxu_26880_3_20200716_223916.da
DOB: 03/17/1995  HRN: 7120     ARIZONA    IHS-112323


Query or VXU (1094)
--------------------------------------------------------------------------
MSH|^~\&|NISTERHAPP^2.16.840.1.113883.3.72.5.40.1^ISO|NISTERHFAC^2.16.840.1
    .113883.3.72.5.40.2^ISO|NISTIISAPP^2.16.840.1.113883.3.72.5.40.3^ISO|NISTII
    SFAC^2.16.840.1.113883.3.72.5.40.3^ISO|20200716223915-0700|MAINMSH8.1|
    .5.1|||ER|AL|USA|||||Z22^CDCPHINVS^^|NISTEHRFAC^^^^^RPMS&2.16.840.1.113883.3
    .72.5.40.9&ISO^XX^^^100-6482|NISTIISFAC^^^^^RPMS&2.16.840.1.113883.3.72.5.4
    0.9&ISO^XX^^^100-3322
PID|1||232101007120^^^2020 DEMO HOSPITAL^MR||PATIENT^DEMO^^^^^L^^^^^||1995
    0317|F||2106-3^WHITE^CDCREC|763 MAIN ST^^BOZEMAN^MT^59715^USA^P||^PRN^PH^^^
    999^9999999~^NET^Internet^Demo.Patient@isp.com|||||||||2186-5^NOT HIS
    ||N
PD1|||MAINPD13.1|||||||||02^REMINDER/RECALL - ANY METHOD^HL70215|Y|20150625|
    ||A|19950317|19950317
ORC|RE|194925-232101^IHS|2321018150194925^IHS||IP||||||7824^PROVIDER^DEMO^^^
    ^^^NPI^L^^^NPI|||||||232101^2020 DEMO HOSPITAL^HL70362
RXA|0|1|20150317120000|20150317120000|121^Zostavax^CVX|999|||01^HISTORICAL
    INFORMATION - SOURCE UNSPECIFIED^NIP001||^^^NIST-CLINIC-1&2.16.840.1.113883
    .3.72.5.40.7&ISO|||||||||CP|A|20150317120000
```

Review Query or VXU Response

This option allows the user to review the response returned by the SIIS, whether the response is an acknowledgement to an Unsolicited Vaccine Record Update (VXU) message or a response to an Immunization History/Forecast request.

The user has the option to display only the Immunization Information or to display the complete HL7 message.

The next slide shows an example of the Immunization Information display and the slide that follows has an example of the HL7 display.

Review Query or VXU Response (Immunization Information)

```
Review Responses from the State IIS

        Select Original Query or VXU sent

Select by Pat Name, Query/VXU Date or Message ID: PATEINT,DEMO  izrt_vxu_26880_3_20200716_223916.dat     PATIENT,DEMO     Jul 16,2020@22:39:16     IHS-112323     ARIZONA

     Select one of the following:

        1          Immunization Information Only
        2          HL7 Message Content

Which display option: Immunization Information Only//

Query response for:            Date/State File Name/Message ID
------------------------------ ---------- -------------------------------------
PATIENT,DEMO  (F)              07/16/2020 izrt_vxu_26880_3_20200716_223916.da
DOB: 03/17/1995  HRN: 7120     ARIZONA    NIST-IZ-AD-7.1_Send_V04_Z22

Response: (1130) for Query or VXU (1094)
----------------------------------------------------------------------------
Error LINE: 3
     The SIIS reports an error in Message ID: NIST-IZ-AD-7.1_Send_V04_Z22.
     The ERROR is in the 1st 'RXA' Segment.
     Field RXA-5.1: Vaccine Identifier
     NOTE: in Message ID 'NIST-IZ-AD-7.1_Send_V04_Z22' Vaccine code not rec
        ognized - message rejected


Press <ENTER> to continue or '^' to exit...:
```

Review Query or VXU Response (HL7)

```
Query response for:              Date/State File Name/Message ID
-------------------------------- ---------- -------------------------------------
PATIENT,DEMO  (F)                07/16/2020 izrt_vxu_26880_3_20200716_223916.da
DOB: 03/17/1995  HRN: 7120       ARIZONA    NIST-IZ-AD-7.1_Send_V04_Z22


Response: (1130) for Query or VXU (1094)
--------------------------------------------------------------------------------
MSH|^~\&|NISTIISAPP|NISTIISFAC|NISTEHRAPP|NISTEHRFAC|20150625121047.853-050
    0||ACK^V04^ACK|NIST-IZ-AD-7.2_Receive_ACK_Z23|P|2.5.1|||NE|NE|||||Z23^CDCPH
    INVS|NISTIISFAC^^^^^NIST-AA-IZ-1^XX^^^100-3322|NISTEHRFAC^^^^^NIST-AA-
MSA|AE|NIST-IZ-AD-7.1_Send_V04_Z22
ERR||RXA^1^5^1^1|999^Application error^HL70357|E|5^Table value not found^HL
    70533|||Vaccine code not recognized - message rejected
```

Objective 4: HL7 Message Differences

Differentiate between the different HL7 messages sent by the BYIM Immunization Package

- Send Immunization Information to the SIIS (Pre-BYIM v3.0 functionality)
  - Z22: **Send Unsolicited Immunization Update (VXU)**: This sends both Immunizations Administered and Immunization History to the SIIS. This is normally sent in batch mode at the end of the day.
  - Z23: **Return an Acknowledgement (ACK)**: This can return either an Application Accept (AA), an Application Error (AE) or an Application Reject (AR).
- Query/Response (New BYIM v3.0 functionality)
  - Z44: **Request Evaluated Immunization History and Forecast Query**
  - Z42: **Return Evaluated History and Forecast**
  - Z33: **Return an Acknowledgement with No Person Records**: This will be returned if a matching patient is not found, too many matching patients were found (so the SIIS did not know which one to return), or an error occurred when processing the array.

Objective 5: General HL7 Message Format

- Provide a general overview of the HL7 message structure and content.

General HL7 Message Format

- An individual immunization message starts with a Message Header (MSH) segment. The first three characters are the Segment Identifier (MSH) followed by the field separator character ("|"), followed by the other delimiters ("^~\&").
  - Caret (**^**): Component separator
  - Tilde (**~**): Repetition separator
  - Backslash (\): Escape character
  - Ampersand (**&**): Subcomponent separator
- The other segments will start with their respective segment identifier (e.g., PID, ORC) followed by the data.
- Note that the **Send Unsolicited Immunization Update (VXU-Z22)** messages are sent as a batch, so they also include a batch header and footer.

```
MSH|^~\&|NISTEHRAPP|NISTEHRFAC|NISTIISAPP|NISTIISFAC|20150624073733.994-0500||VXU^V04^VXU_V04|NIST-IZ-AD-
1.1_Send_V04_Z22|P|2.5.1||||ER|AL||||||Z22^CDCPHINVS|NISTEHRFAC|NISTIISFAC
```

Send Unsolicited Immunization Update (Z22)

- A **Send Unsolicited Immunization Update (Z22)** outgoing message may have the following segments:
  - MSH: Message Header Segment
  - PID: Patient Identifier Segment
  - PD1: Patient Demographic Segment
  - NK1: Next of Kin Segment—may be a repeating segment
  - PV1: Patient Visit Segment
  - IN1: Insurance Segment
  - Order Group: This group can be repeating.
    - ORC: Order Request Segment
    - RXA: Pharmacy/Treatment Administration Segment
    - RXR: Pharmacy/Treatment Route Segment
    - Observation Group: This group can be repeating.
      - OBX: Observation Result Segment
      - NTE: Note Segment

Return an Acknowledgement (Z23) response

- A **Return an Acknowledgement (Z23**) response message may have the following segments:
  - MSH: Message Header Segment
  - MSA: Message Acknowledgement Segment
  - ERR: Error Segment (only present if there was an error and may be repeating)

Request Evaluation Immunization History and Forecast Query (Z44)

- A **Request Evaluation Immunization History and Forecast Query (Z44)** outgoing message may have the following segments:
  - MSH: Message Header Segment
  - QPD: Input Parameter Specifications
  - RCP: Response Control Parameter

Evaluated History and Forecast Response (Z42)

- An **Evaluated History and Forecast Response (Z42)** response message may have the following segments:
  - MSH: Message Header Segment
  - MSA: Message Acknowledgement Segment
  - ERR: Error Segment (only present if there was an error)
  - QAK: Query Acknowledgement Segment
  - QPD: Input Parameter Specifications
  - PID: Patient Identifier Segment
  - Order Group: This group may be repeating
    - ORC: Order Request Segment
    - RXA: Pharmacy/Treatment Administration Segment
    - RXR: Pharmacy/Treatment Route Segment
    - Observation Group: This group may be repeating
      - OBX: Observation Result Segment
      - NTE: Note Segment

Return an Acknowledgement with No Person Records (Z33)

- A **Return an Acknowledgement with No Person Records (Z33)** response message may have the following segments:
  - MSH: Message Header Segment
  - MSA: Message Acknowledgement Segment
  - ERR: Error Segment (only present if there was an error)
  - QAK: Query Acknowledgement Segment
  - QPD: Input Parameter Specifications

Questions and Discussion

Thanks for joining the training presentation. Please feel free to ask additional questions or continue the discussion!