Test Plan Summary

HIMSS Immunization Integration Program CDC Test Plan v7.5

Description

Test Objectives

Test Case Group: Initial Data Load

Description

Test Objectives

The initial data load will consist of the vendor entering data during live interactive testing for 4 patients with various scenarios. The data entry will include demographic data, Immunization histories and specific conditions for each patient. The initial data load will also populate the inventory used in the use case.

Test Case	Juana Mariana Vazquez Initial Data Load

Description

The practice site for the scenario is Shoreline Pediatrics. The EHR vendor loads demographic data and clinical history for Juana Mariana Vazquez. The data includes immunizations provided by the practice.

The vendor also enters:

-Two vaccines administered at other sites

1. an influenza vaccine given at a local pharmacy
2. an inactivated polio vaccine given elsewhere and not reported to the registry - the history includes an adverse reaction (febrile seizure) 8 hours after the vaccine was administered

- Adverse reaction to inactivated polio vaccine (febrile seizure) and the date and source of information

NOTE: the historical vaccines will be imported during the Registry query (e.g. from another practice)

Test Objectives

Register New Patients: The system must allow a user to enter distinguishing information about patients

so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Record Past Immunizations: The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details.

Request/Receive Patient Immunization Data and Identify Source: The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

Supporting data for:

Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History: The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information.

Identify Adverse Event: The EHR or other clinical software system enables capture of structured data regarding adverse events.

Test Steps	
Enter Initial Demographic Data for New Patient Juana Mariana Vazquez	**Description** The EHR vendor loads demographic data for Juana Mariana Vazquez. **Test Objectives** ***Register New Patients:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Enter Initial Immunization Data for Juana Mariana Vazquez: Immunizations from practice	## Description The EHR vendor loads immunization history data from the local practice for Juana Mariana Vazquez. This includes an MMR dose that was given too early. This MMR dose serves to seed checking for dose given too early in TestCaseGroup: Juana Mariana Vazquez Visit, TestCase: Query the Registry for Juana Mariana Vazquez, TestStep: Mark first MMR Dose as Invalid. ## Test Objectives ***Record Past Immunizations:*** The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details. ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. Supporting data for: ***Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History:*** The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information. ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.
	## Description The EHR vendor loads immunization history data from another practice into the record for Juana Mariana Vazquez. ## Test Objectives

Enter Initial Immunization Data for Juana Mariana Vazquez from Another Practice	***Record Past Immunizations:*** The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details. ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. Supporting data for: ***Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History:*** The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information.
Enter Initial Immunization Data for Juana Mariana Vazquez Reported by Parent	## Description The provider enters immunization data from a pharmacy as reported by the parent for Juana Mariana Vazquez. ## Test Objectives ***Record Past Immunizations:*** The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details. ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. Supporting data for: ***Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History:*** The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from

	the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information.

Test Case	Juan Marcel Marina Initial Data Load

Description

The practice site for the scenario is Shoreline Pediatrics. The EHR vendor loads demographic data and clinical history for Juan Marcel Marina. The data includes a clinical history of varicella, and serological evidence of Hepatitis A immunity.

Test Objectives

Register New Patients: The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Supporting data for:

Modify Antigen Recommendations Based on Active Diagnoses: *The system notifies the provider of any conflicts between recommended vaccines in the updated forecast and the patient's current or historical diagnoses.*

Test Steps

Enter Initial Demographic Data for New Patient Juan Marcel Marina	## Description The EHR vendor loads demographic data for Juan Marcel Marina. ## Test Objectives ***Register New Patients:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Enter Clinical History for Juan Marcel Marina	**Description** The clinical history of Chicken Pox (Varicella) is documented in the record created for Juan Marcel Marina. The lab tests show serologic immunity to Hep A and a finding is added indicating Hepatitis A Immune **Test Objectives** Supporting data for: ***Modify Antigen Recommendations Based on Active Diagnoses:*** *The system notifies the provider of any conflicts between recommended vaccines in the updated forecast and the patient's current or historical diagnoses.* In this case, the vaccine is not recommended due to the history of the vaccine preventable condition (Varicella).

Test Case	**Juana Mariela Gonzales Initial Data Load**

Description

The practice site for the scenario is Shoreline Pediatrics. The EHR vendor loads demographic data and clinical history for twin Juana Mariela Gonzales.

Test Objectives

Register New Patients: The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Test Steps

Enter Initial	**Description** The EHR vendor loads demographic data for Juana Mariela Gonzales. **Test Objectives**

Demographic Data for Juana Mariela Gonzales	***Register New Patients:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Test Case	**Juana Maria Gonzales Initial Data Load**

Description

The practice site for the scenario is Shoreline Pediatrics. The EHR vendor loads demographic data and clinical history for twin Juana Maria Gonzales.

Test Objectives

Register New Patients: The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Test Steps

Enter Initial Demographic Data for Juana Maria Gonzales	## Description The EHR vendor loads demographic data for Juana Maria Gonzales. ## Test Objectives ***Register New Patients:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Test Case	Enter Inventory

Description

The provider enters vaccine inventory data from available inventory.

Test Objectives

Update Vaccine Inventory from Stock Receipt: The EHR or other clinical software system updates the vaccine inventory when new stock is received at the site and updates the correct count of each vaccine, including those for use in guarantee programs (such as Vaccines for Children) and for private stock.

Display Available Vaccine Antigens: The system presents a list of vaccine antigens available for administration to patients (i.e., private stock Vs. specific guarantee program).

Test Steps

Enter Vaccine Inventory	**Description** The provider receives a vaccine delivery and records the new vaccine data in available inventory. **Test Objectives** ***Update Vaccine Inventory from Stock Receipt:*** The EHR or other clinical software system updates the vaccine inventory when new stock is received at the site and updates the correct count of each vaccine, including those for use in guarantee programs (such as Vaccines for Children) and for private stock.
View Inventory	**Description** The provider reviews the full list of vaccine inventory. **Test Objectives** ***Display Available Vaccine Antigens:*** The system presents a list of vaccine antigens available for administration to patients (i.e., private stock Vs. specific guarantee program).

Test Case Group: Juana Mariana Vazquez Visit

Description

Test Objectives

Juana Mariana Vazquez visits the provider where her immunization history is retrieved from the registry and reconciled with the local information in the medical record to determine vaccines that are due. Vaccinations are ordered and administered. The parents refuse the Polio vaccine due to prior issues. The vaccines are reported to the immunization registry and a vaccine summary is available for the patient.

Test Case	Query the Registry for Juana Mariana Vazquez

Description

The EMR generates a Z44 query to the Immunization Registry to retrieve the Evaluated History and Forecast for Juana Mariana Vazquez.
Querying the registry will consist of the vendor creating Z44 messages for Juana Mariana Vazquez to be sent to the registry. The response will be processed as part of the 'Display, Reconcile, Import and Update Immunization Information' activity.

Using the Z42 Response to Immunization Registry Query, the EMR displays the Evaluated History and Forecast to the user for reconciliation and update. The vendor will receive information back from the registry and show the ability to view and reconcile, and import the information returned by the registry (NOTE: the Z42 message will be provided either manually, or as part of the tool). This test will also look at the system's ability to view the forecast returned by the registry, and create a new forecast after reconciling the information.

Test Objectives

Select New Patient: *The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.*

Real Time Request/Receive Patient Immunization History: The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).

Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History: *The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information.*

Request/Receive Patient Immunization Data and Identify Source: *The EHR or other clinical software is able to*

store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

View Immunization Forecast: *The system provides a view of the immunization forecast provided by the public health immunization registry (IIS). The display includes the forecast from the registry and includes recommended vaccination dates, minimum (earliest) date, date due, and maximum (latest) date for each vaccine included in the forecast.*

View Reconciled Immunization Forecast: *The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.*

Review Patient Immunization History: *To assist with the ordering process, the EHR or other clinical software system allows a user to specify standard views of patient immunization information for each vaccine dose administration, including patient-specific data (e.g., age on dates of administration, etc.).*

Record Past Immunizations: The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details.

Support for:
Receive Dose Not Indicated Alert for Single Vaccine Order: *The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.*

Test Steps

Select Patient Juana Mariana Vazquez	**Description** Juana Mariana Vazquez is selected as the patient and her record is opened in the EMR. **Test Objectives** ***Select New Patient:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.
	Description

Query Registry for vaccination history and forecast for Juana Mariana Vazquez	The provider uses the EMR to query the Immunization Registry for an Evaluated History and Forecast based on information known to the Immunization Registry. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). ***Support for:*** ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** *The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.*
	## Description The Immunization Registry returns an Evaluated History and Forecast (Z42) to the EMR in response to the query for patient (Juana Mariana Vazquez). The provider reviews the immunization history from the registry and compares to the immunization history in the EMR. The provider reviews the information from these sources, identifying information known only to the registry, and identifying information that is more accurately reflected in the local EMR: The physician accesses the record for Juana Mariana Vazquez and the EHR Differentiates: The following vaccinations are available only to the EMR: - diphtheria, tetanus toxoids and acellular pertussis vaccine, 5 pertussis antigens (CVX 106) administered 11/20/2016 - poliovirus vaccine, inactivated (CVX 10) administered 2/21/2014, o Adverse Reaction: febrile seizure (e.g. Simple febrile seizure (finding) 432354000) VXC11^convulsions (fits, seizures) within 72 hours of dose^CDCPHINV) - Influenza, injectable,quadrivalent, preservative free, pediatric (CVX 161) administered 10/15/2017, The EHR differentiates the following vaccinations which differ between the EMR and the

	IIS: - For the hepatitis B vaccine, pediatric or pediatric/adolescent dosage (CVX 08) administered 12/20/2013, that EMR displays different text for the IIS (which documents a Non-specific formulation) and EMR (which documents hepatitis B vaccine, pediatric or pediatric/adolescent dosage) for Vaccine administered The EHR differentiates the following vaccinations that are available from both the IIS that and the local EMR: - measles, mumps, rubella virus vaccine (CVX 03) administered 8/22/2014 (an invalid dose) - poliovirus vaccine, inactivated (CVX 10) administered 2/21/2015, o Adverse Reaction: febrile seizure (e.g. Simple febrile seizure (finding) 432354000) VXC11^convulsions (fits, seizures) within 72 hours of dose^CDCPHINV) The EHR differentiates the following vaccinations are that are available from the IIS that are not known to the local EMR: - hepatitis B vaccine, pediatric or pediatric/adolescent dosage (CVX 08) administered 11/01/2013 - hepatitis B vaccine, pediatric or pediatric/adolescent dosage (CVX 08) administered 05/20/2014 - diphtheria, tetanus toxoids and acellular pertussis vaccine, 5 pertussis antigens (CVX 106) administered 1/22/2014 - diphtheria, tetanus toxoids and acellular pertussis vaccine, 5 pertussis antigens (CVX 106) administered 3/23/2014, - diphtheria, tetanus toxoids and acellular pertussis vaccine, 5 pertussis antigens (CVX 106) administered 5/22/2014 - diphtheria, tetanus toxoids and acellular pertussis vaccine, 5 pertussis antigens (CVX 106) administered 2/21/2015
View and Compare response to request for vaccination history for Juana	- Haemophilus influenzae type b vaccine, PRP-OMP conjugate (CVX 49) administered 1/22/2014 - Haemophilus influenzae type b vaccine, PRP-OMP conjugate (CVX 49) administered 3/23/2014 - Haemophilus influenzae type b vaccine, PRP-OMP conjugate (CVX 49) administered 5/22/2014

Mariana Vazquez	- Haemophilus influenzae type b vaccine, PRP-OMP conjugate (CVX 49) administered 11/21/2014 - poliovirus vaccine, inactivated (CVX 10) administered 1/22/2014 - poliovirus vaccine, inactivated (CVX 10) administered 3/23/2014 - pneumococcal conjugate vaccine, 13 valent (CVX 133) administered 1/22/2014 - pneumococcal conjugate vaccine, 13 valent (CVX 133) administered 3/23/2014 - pneumococcal conjugate vaccine, 13 valent (CVX 133) administered 5/22/2014 - pneumococcal conjugate vaccine, 13 valent (CVX 133) administered 1/11/2015 - rotavirus, live, monovalent vaccine (CVX 119) administered 1/22/2014 - rotavirus, live, monovalent vaccine (CVX 119) administered 3/23/2014 - Influenza, injectable,quadrivalent, preservative free, pediatric (CVX 161) administered 9/25/2014 - Influenza, injectable,quadrivalent, preservative free, pediatric (CVX 161) administered 10/29/2014 - Influenza, injectable,quadrivalent, preservative free, pediatric (CVX 161) administered 10/2/2015 - Influenza, injectable,quadrivalent, preservative free, pediatric (CVX 161) administered 11/4/2016 - hepatitis A vaccine, pediatric/adolescent dosage, 2 dose schedule (CVX 83) administered 11/23/2014 - hepatitis A vaccine, pediatric/adolescent dosage, 2 dose schedule (CVX 83) administered 5/23/2015 - measles, mumps, rubella virus vaccine (CVX 03) administered 11/22/2017 - Varicella virus vaccine (CVX 21) administered 12/15/2015 **Test Objectives**

	Real Time Request/Receive Patient Immunization History: The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). ***Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History:*** The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information. ***Review Patient Immunization History:*** To assist with the ordering process, the EHR or other clinical software system allows a user to specify standard views of patient immunization information for each vaccine dose administration, including patient-specific data (e.g., age on dates of administration, etc.). ***Support for:*** ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** *The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.*
Mark first MMR Dose as Invalid	**Description** If the EHR does not already flag the first MMR as invalid, the provider updates the first MMR to indicate it is "invalid" as it was given too early (as notified by the registry) **Test Objectives** dose validity is an important aspect of: ***View Reconciled Immunization Forecast:*** *The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.*
View the vaccination forecast for Juana Mariana	**Description** The physician accesses the record for Juana Mariana Vazquez and: - Displays the registry forecast as returned by the immunization registry **Test Objectives**

Vazquez	***View Immunization Forecast:*** The system provides a view of the immunization forecast provided by the public health immunization registry (IIS). The display includes the forecast from the registry and includes recommended vaccination dates, minimum (earliest) date, date due, and maximum (latest) date for each vaccine included in the forecast.
Reconcile and import vaccinations from Evaluated History and Forecast for Juana Mariana Vazquez	**Description** Juana Mariana Vazquez immunization registry provided Evaluated History and Forecast is reconciled with the Immunization history information in the EMR. **Test Objectives** ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. ***Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History:*** The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information. ***Review Patient Immunization History:*** To assist with the ordering process, the EHR or other clinical software system allows a user to specify standard views of patient immunization information for each vaccine dose administration, including patient-specific data (e.g., age on dates of administration, etc.). ***Support for:*** ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** *The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.*
View the updated vaccination forecast for	**Description** Once the vaccine history is reconciled in the EMR, the vaccine forecast is updated. **Test Objectives**

Juana Mariana Vazquez	***View Reconciled Immunization Forecast:*** The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.

Test Case	**Juana Mariana Vazquez, Enter Orders and Immunizations**

Description

This test will consist of ordering vaccines for the test patients, reviewing any alerts caused by specific scenarios, and documenting vaccinations administered to the patients.

Test Objectives

Notify of Previous Adverse Event: EHRs and other clinical software systems alert providers to previous adverse events for a specific patient, in order to inform clinical decision-making when providers view an existing immunization record.

Record Vaccine Administration Deferral: The EHR or other clinical software system allows a user to enter a reason or reasons why a specific immunization was not given to a patient (e.g., due to contraindication, refusal, etc.). The system also stores that information in a structured way so it can be reported and analyzed as needed.

Receive Dose Not Indicated Alert for Single Vaccine Order: The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.

Record Vaccine Administration: The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.

Enter Vaccination Order: The EHR or other clinical software system allows providers to order immunizations for a patient using filters for type of vaccine, including combination vaccines.

Record Past Immunizations: The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details.

Request/Receive Patient Immunization Data and Identify Source: The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

Sample of data quality checking for vaccine route.

Test Steps	
Order IPV and view prior reaction	## Description The physician accesses the record for Juana Mariana Vazquez and: - Selects order for IPV and views information about the prior febrile seizure post-IPV vaccine - IPV is ordered for the patient ## Test Objectives ***Enter Vaccination Order:*** The EHR or other clinical software system allows providers to order immunizations for a patient using filters for type of vaccine, including combination vaccines. ***Notify of Previous Adverse Event:*** EHRs and other clinical software systems alert providers to previous adverse events for a specific patient, in order to inform clinical decision-making when providers view an existing immunization record.
IPV Parental Refusal	## Description The mother is concerned about administering the IPV due to the prior adverse reaction, and refuses to have the child immunized for IPV. The provider documents mother's refusal for IPV vaccine indicating the parent decision, the reason and documents a deferral at the time of attempted administration. ## Test Objectives ***Record Vaccine Administration Deferral:*** The EHR or other clinical software system allows a user to enter a reason or reasons why a specific immunization was not given to a patient (e.g., due to contraindication, refusal, etc.). The system also stores that information in a structured way so it can be reported and analyzed as needed.
	## Description The EHR vendor loads immunization history data for an MMR dose entered 2 weeks prior to the current visit date and an MMR dose that was given too early. These MMR doses serve to seed checking for the condition that it is too early to give a live vaccine in TestCaseGroup: Juana Mariana Vazquez Visit, TestCase: Juana Mariana Vazquez, Enter Orders and Immunizations, TestStep: Attempt to order Varicella Dose.

Enter Immunization Data for MMR Given 2 Weeks Prior	## Test Objectives ***Record Past Immunizations:*** The EHR or other clinical software system allows providers to enter information about immunizations given elsewhere (e.g., by another doctor, at a public health clinic, pharmacy, etc.) with incomplete details. ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. Supporting data for: ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.
Attempt to order Varicella Dose	## Description The provider attempts to give a Varicella dose, and is warned that it is too soon to give a live vaccine dose. ## Test Objectives ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.
Order Influenza Vaccine	## Description The physician accesses the record for Juana Mariana Vazquez and: - Selects order for Influenza vaccine ## Test Objectives ***Enter Vaccination Order:*** The EHR or other clinical software system allows providers to order immunizations for a patient using filters for type of vaccine, including combination vaccines.

Records Influenza Vaccine administration route with data validation checking	**Description** The nurse documents administration route for the IM inactivated influenza vaccine as 'intranasal' - Is prevented from documenting "intranasal" for intramuscular inactivated influenza vaccine **Test Objectives** ***Record Vaccine Administration:*** The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size. Sample of data quality checking for vaccine route.
Record Influenza Vaccine administration	**Description** The nurse administers the inactivated influenza vaccine - Documents all required information for the vaccine **Test Objectives** ***Record Vaccine Administration:*** The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.

Test Case	**Juana Mariana Vazquez Transmit Immunization Report**

Description

Following the vaccinations given during the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes all newly administered vaccines. The report should include vaccines incorrectly recorded in the IIS. The report MAY send the immunizations that the EMR imported from the IIS.

Test Objectives

Transmit Standard Patient Immunization History Report: The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

Identify Adverse Event: The EHR or other clinical software system enables capture of structured data regarding adverse events.

Notify Public Health Immunization Registry (IIS) of Update from Adverse Event: The EHR or other clinical software system notifies the public health immunization registry (IIS) of an update due to an adverse event.

Link Standard Codes to Immunization Data: The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization.
a. NDC codes, CVX for immunizations

Test Steps

Transmit the immunization report to the Immunization Registry	## Description Following the vaccinations given during the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes all newly administered vaccines. The report should include vaccines incorrectly recorded in the IIS. The report MAY send the immunizations that the EMR imported from the IIS. ## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations
Receive ACK Z23 from Immunization Registry	## Description The Immunization Registry returns a positive acknowledgement message indicating that no errors were found during the course of filing the message. ## Test Objectives

	Transmit Standard Patient Immunization History Report: The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.
Record an adverse reaction	## Description Following the vaccine administration, the mother reports that the patient had a rash within 14 days of dose. ## Test Objectives ***Identify Adverse Event:*** The EHR or other clinical software system enables capture of structured data regarding adverse events. Support for: ***Notify Public Health Immunization Registry (IIS) of Update from Adverse Event:*** The EHR or other clinical software system notifies the public health immunization registry (IIS) of an update due to an adverse event.
Transmit the updated vaccination report with adverse reaction to the registry	## Description The adverse reaction to the Influenza vaccination of rash within 14 days of dose is reported to the Immunization Registry using a Z22/VXU message. ## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. ***Identify Adverse Event:*** The EHR or other clinical software system enables capture of structured data regarding adverse events. ***Notify Public Health Immunization Registry (IIS) of Update from Adverse Event:*** The EHR or other clinical software system notifies the public health immunization registry (IIS) of an update due to an adverse event. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations
	## Description The Immunization Registry returns a positive acknowledgement message indicating that no errors were found during the course of filing the message.

Receive ACK Z23 from Immunization Registry for Updated Transmission	## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

Test Case	**Juana Mariana Vazquez Display Immunization Report**
## Description Following the vaccination visit, the provider uses the EMR to produce an immunization report for the patient including all history (the report can be provided in various formats - e.g., print, send to patient portal, etc.) ## Test Objectives ***Produce Standard Patient Immunization History Report:*** The EHR or other clinical software system produces a report of a patient's immunization history that is appropriate for various entities, such as schools and day-care centers. ***Produce Immunization Forecast Report:*** The EHR or other clinical software system creates a list of immunizations to be administered within a specified time frame.	
Test Steps	
Produce an immunization report for Juana Mariana Vazquez including all history	## Description Following the vaccination visit, the provider uses the EMR to produce an immunization report for the patient including all history (the report can be provided in various formats - e.g., print, send to patient portal, etc.) ## Test Objectives ***Produce Standard Patient Immunization History Report:*** The EHR or other clinical software system produces a report of a patient's immunization history that is appropriate for various entities, such as schools and day-care centers. ***Produce Immunization Forecast Report:*** The EHR or other clinical software system creates a list of immunizations to be administered within a specified time frame.

Test Case	**Juana Mariana Vazquez Provide Patient Access to Immunization Report**

Description

Following the vaccination visit, the provider uses the EMR to produce an immunization report that can be accessed by the patient including all history (the report can be provided in various formats - e.g., print, send to patient portal, etc.) and the vaccine forecast.

Test Objectives

Produce Standard Patient Immunization History Report: The EHR or other clinical software system produces a report of a patient's immunization history that is appropriate for various entities, such as schools and day-care centers.

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Test Steps	
Produce an immunization report for Juana Mariana Vazquez including all history	**Description** Following the vaccination visit, the patient/parent uses the specified interface to access the immunization report for the patient including all history (the report can be provided in various formats - e.g., print, send to patient portal, etc.) **Test Objectives** **Provide Access to Patient Immunization Record:** The EHR or other clinical software system provides patients and their authorized representatives with electronic access to immunization records (either directly or by interacting with an external system such as a patient portal).

Test Case Group: Juan Marcel Marina Visit

Description

Test Objectives

Juan Marcel Marina visits the provider where his immunization history is retrieved from the registry and reconciled with the local information in the medical record to determine vaccines that are due. Vaccinations are ordered and administered. The vaccines are reported to the immunization registry and a vaccine summary is available for the patient.

Test Case	Query the Registry for Juan Marcel Marina

Description

The EMR Generates a Z44 query to the Immunization Registry to retrieve the Evaluated History and Forecast for Juan Marcel Marina. Querying the registry will consist of the vendor creating Z44 messages for Juan Marcel Marina to be sent to the registry. The response will be processed as part of the 'Display, Reconcile, Import and Update Immunization Information' activity.

Using the Z42 Response to Immunization Registry Query, the EMR displays the Evaluated History and Forecast to the user for reconciliation and update. The vendor will receive information back from the registry and show the ability to view and reconcile, and import the information returned by the registry (NOTE: the Z42 message will be provided either manually, or as part of the tool). This test will also look at the system's ability to view the forecast returned by the registry, and create a new forecast after reconciling the information.

Test Objectives

Select New Patient: The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Real Time Request/Receive Patient Immunization History: The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).

Request/Receive Patient Immunization Data and Identify Source: The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

View Reconciled Immunization Forecast: The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.

Review Patient Immunization History: To assist with the ordering process, the EHR or other clinical software system allows a user to specify standard views of patient immunization information for each vaccine dose administration, including patient-specific data (e.g., age on dates of administration, etc.).

Support for:

Receive Dose Not Indicated Alert for Single Vaccine Order: The EHR or other clinical software system notifies

the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.

Test Steps	
Select Patient Juan Marcel Marina	## Description Juan Marcel Marina is selected as the patient and his record is opened in the EMR. ## Test Objectives ***Select New Patient:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.
Query Registry for vaccination history and forecast for Juan Marcel Marina	## Description The provider uses the EMR to query the Immunization Registry for an Evaluated History and Forecast based on information known to the Immunization Registry. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).
	## Description The physician accesses the record for Juan Marcel Marina and: - Accepts the vaccines provided by the registry as this is a new patient and there are no prior vaccines recorded

View and import response to request for vaccination history for Juan Marcel Marina	## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. ***Compare Public Health Immunization Registry (IIS) Immunization History to EHR Immunization History:*** The public health immunization registry has returned the requested immunization history for a patient. The EHR is able to display the immunization history received from the registry as well as the immunization history already present in the EHR so that a user can compare them. The EHR provides a way for the provider to view both histories, determine what is different (if anything), and update the existing EHR immunization history with new information from the public health registry if he or she chooses to do so. The system must store the new information as structured data as part of the patient's local immunization history and include the time of the update and the source of the new information. ***Review Patient Immunization History:*** To assist with the ordering process, the EHR or other clinical software system allows a user to specify standard views of patient immunization information for each vaccine dose administration, including patient-specific data (e.g., age on dates of administration, etc.). Supporting data for: ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.
View the vaccination forecast for Juan Marcel Marina	## Description The physician accesses the record for Juan Marcel Marina and, once the vaccine history is reconciled in the EMR, the vaccine forecast is updated. - The provider views the updated vaccine forecast (either as provided by the Immunization Registry or as determined through EMR defined methods) ## Test Objectives ***View Reconciled Immunization Forecast:*** The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization

	data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service. ***Modify Antigen Recommendations Based on Active Diagnoses:*** The system notifies the provider of any conflicts between recommended vaccines in the updated forecast and the patient's current or historical diagnoses.

Test Case	Juan Marcel Marina, Enter Orders and Immunizations

Description

This test will consist of ordering vaccines for the test patients, reviewing any alerts caused by specific scenarios, and documenting vaccinations administered to the patients.

Test Objectives

Modify Antigen Recommendations Based on Active Diagnoses: The system notifies the provider of any conflicts between recommended vaccines in the updated forecast and the patient's current or historical diagnoses.

Enter Vaccination Order: The EHR or other clinical software system allows providers to order immunizations for a patient using filters for type of vaccine, including combination vaccines.

Receive Dose Not Indicated Alert for Single Vaccine Order: The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required.

Notify of Vaccine Dose Expiration: The EHR or other clinical software system notifies the provider administering a vaccine if the dose chosen for administration is expired.

Record Vaccine Administration: The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.

Notify of Vaccine Dose Ineligibility: The EHR or other clinical software system provides a method for alerting a provider if a vaccine is selected for a patient who is not eligible for the inventory item selected.

Test Steps

Orders administration of Hepatitis B vaccine	## Description As indicated by the vaccine forecast, the third Hepatitis B is overdue, and is ordered. ## Test Objectives ***Enter Vaccination Order:*** The EHR or other clinical software system allows

	providers to order immunizations for a patient using filters for type of vaccine, including combination vaccines.
Orders administration of DTaP vaccine and alerted that the dose is too early	## Description The fifth DTaP is ordered, and the provider is notified that the dose is too early. ## Test Objectives ***Receive Dose Not Indicated Alert for Single Vaccine Order:*** The EHR or other clinical software system notifies the provider in instances when there are single or combination vaccine orders that are inconsistent with the expected timing intervals included in the vaccine forecast. Inconsistencies include suggestion of different date(s) for ordering the vaccine(s) or indication the vaccine(s) is/are no longer required. ***Enter Vaccination Order:*** The EHR or other clinical software system allows providers to order immunizations for a patient using filters for type of vaccine, including combination vaccines.
Attempt to record HepB Vaccine administration route with data validation checking	## Description The nurse documents administration route for the HepB vaccine - Is prevented from documenting "oral" for HepB vaccine ## Test Objectives ***Record Vaccine Administration:*** The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size. Sample of data quality checking for vaccine route.
Records Hepatitis B Vaccine lot number with expired lot alert	## Description The nurse documents administration lot number for the Hepatitis B vaccine - Is prevented from ordering the Hepatitis B lot as it has expired - Documents administration from a different lot that is not expired ## Test Objectives

	Notify of Vaccine Dose Expiration: The EHR or other clinical software system notifies the provider administering a vaccine if the dose chosen for administration is expired.
Record Hepatitis B Vaccine administration	**Description** The nurse administers the the Hepatitis B vaccine • Documents all required information for the vaccine **Test Objectives** ***Record Vaccine Administration:*** The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.
Records Influenza Vaccine administration with VFC eligibility checking	**Description** The nurse documents administration for the inactivated influenza vaccine from a VFC source - Is alerted that the patient is not eligible for VFC - Orders a different non-VFC lot of inactivated influenza vaccine **Test Objectives** ***Notify of Vaccine Dose Ineligibility:*** The EHR or other clinical software system provides a method for alerting a provider if a vaccine is selected for a patient who is not eligible for the inventory item selected.
	Description

Record Influenza Vaccine administration for Juan Marcel Marina	The nurse administers the inactivated influenza vaccine - Documents all required information for each vaccine ## Test Objectives ***Record Vaccine Administration:*** The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.

Test Case	**Juan Marcel Marina Transmit Immunization Report**

Description

Following the vaccinations given during the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes all newly administered vaccines. The report should include vaccines incorrectly recorded in the IIS. The report MAY send the immunizations that the EMR imported from the IIS.

Test Objectives

Transmit Standard Patient Immunization History Report: The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

Link Standard Codes to Immunization Data: The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization.
a. NDC codes, CVX for immunizations

Test Steps

	## Description Following the vaccinations given during the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes all newly administered vaccines, and an indication that Varicella was not administered due to a history of the disease as evidence of immunity. The Vaccination report also includes an indication that Hepatitis A was not administered due to serological evidence of immunity. The report MAY send the immunizations that the EMR imported from the IIS.

Transmit the Immunization Report for Juan Marcel Marina	## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. The VXU/Z22 message passes validation using the NIST Immunization VXU Validation Tool (Z22) (context-free). The content of the message correctly reflects the test data (context-based) in accordance with the Test Data Specification and the Message Content. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations
Receive ACK Z23 from Immunization Registry	## Description The Immunization Registry returns a positive acknowledgement message indicating that no errors were found during the course of filing the message. ## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.
Transmit Delete from Bad Lot	## Description The provider identifies that the vaccine administration of Hepatitis B for this visit was documented in error. The vaccine was not administered during the visit as the provider had received notification that the Hepatitis B vaccine lot 332FK26 had been identified as a bad lot, and no other lot was available from inventory. A delete notification for the Hepatitis B vaccination administered is transmitted to the Immunization Registry for Juan Marcel Marina. ## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations Support for delete functionality.

Receive ACK Z23 from Immunization Registry	**Description** The Immunization Registry returns a positive acknowledgement message indicating that no errors were found during the course of filing the message. **Test Objectives** ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

Test Case Group: Juana Mariela Gonzales Visit

Description

Test Objectives

Infant twin, Juana Mariela Gonzales visits the provider where her immunization history is retrieved from the registry and reconciled with the local information in the medical record to determine vaccines that are due. Vaccinations are deferred due to fever. The vaccine deferrals are reported to the immunization registry and a vaccine summary is available for the patient.

Test Case	Query the Registry for Juana Mariela Gonzales

Description

The EMR Generates a Z44 query to the Immunization Registry to retrieve the Evaluated History and Forecast for Juana Mariela Gonzales. Querying the registry will consist of the vendor creating Z44 messages for Juana Mariela Gonzales to be sent to the registry. The response will be processed as part of the 'Display, Reconcile, Import and Update Immunization Information' activity.

Using the Z42 Response to Immunization Registry Query, the EMR displays the Evaluated History and Forecast to the user for reconciliation and update. The vendor will receive information back from the registry and show the ability to view and reconcile, and import the information returned by the registry (NOTE: the Z42 message will be provided either manually, or as part of the tool). This test will also look at the system's ability to view the forecast returned by the registry, and create a new forecast after reconciling the information.

Test Objectives

Select New Patient: The system must allow a user to enter distinguishing information about patients so that

providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Real Time Request/Receive Patient Immunization History: The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).

Request/Receive Patient Immunization Data and Identify Source: The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

View Reconciled Immunization Forecast: The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.

Test Steps

Select Patient Juana Mariela Gonzales	## Description Juana Mariela Gonzales is selected as the patient and her record is opened in the EMR. ## Test Objectives ***Select New Patient:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.
	## Description The provider uses the EMR to query the Immunization Registry for an Evaluated History

Query Registry for vaccination history and forecast for Juana Mariela Gonzales	and Forecast based on information known to the Immunization Registry. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).
View and import response to request for vaccination history for Juana Mariela Gonzales	## Description The physician accesses the record for Juana Mariela Gonzales and: - Accepts the single vaccine in the registry record into the EHR history ## Test Objectives ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).
View the vaccination forecast for Juana Mariela Gonzales	## Description The physician accesses the record for Juana Mariela Gonzales and: - Views the vaccine forecast (either as provided by the Immunization Registry or as determined through EMR defined methods) ## Test Objectives ***View Reconciled Immunization Forecast:*** The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly

	updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.

Test Case	Juana Mariela Gonzales, Enter Orders and Immunizations

Description

This test will consist of ordering vaccines for the test patients, reviewing any alerts caused by specific scenarios, and documenting vaccinations administered to the patients.

Test Objectives

Supporting data for documenting contraindications (it could also trigger an alert as a locally configured alert rule)

Modify Antigen Recommendations Based on Active Diagnoses: The system notifies the provider of any conflicts between recommended vaccines in the updated forecast and the patient's current or historical diagnoses.

Record Vaccine Administration Deferral: The EHR or other clinical software system allows a user to enter a reason or reasons why a specific immunization was not given to a patient (e.g., due to contraindication, refusal, etc.). The system also stores that information in a structured way so it can be reported and analyzed as needed.

Test Steps

Enter Initial Clinical Information for Juana Mariela	## Description The triage nurse enters basic information on Juana Mariela Gonzales - she has a fever (Temperature of 100.8^{o} F). ## Test Objectives Supporting data for documenting contraindications (it could also trigger an alert as a locally configured alert rule): ***Modify Antigen Recommendations Based on Active Diagnoses:*** The system notifies the provider of any conflicts between recommended vaccines in the updated forecast and the patient's current or historical diagnoses.
	## Description The physician accesses the record for Juana Mariela Gonzales Morales and: - Enters a deferral for the vaccines due (Hepatitis B, DTaP, Hib, Pneumococcal conjugate (PCV13) and Rotavirus) due to medical reason, indicating low grade fever, and defers for 1 month

Enters a deferral for the vaccines due	**Test Objectives** ***Record Vaccine Administration Deferral:*** The EHR or other clinical software system allows a user to enter a reason or reasons why a specific immunization was not given to a patient (e.g., due to contraindication, refusal, etc.). The system also stores that information in a structured way so it can be reported and analyzed as needed.

Test Case	**Juana Mariela Gonzales Transmit Immunization Report**

Description

Following the vaccinations given during the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes deferrals for the vaccines that were due this visit indicating the medical reason. The report MAY send the immunizations that the EMR imported from the IIS.

Test Objectives

Transmit Standard Patient Immunization History Report: The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

Link Standard Codes to Immunization Data: The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization.
a. NDC codes, CVX for immunizations

Test Steps

Transmit the Immunization Report for Juana Mariela Gonzales	**Description** Following the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes the vaccine deferrals. The report MAY send the immunizations that the EMR imported from the IIS. **Test Objectives** ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations

Receive ACK Z23 from Immunization Registry	**Description** The Immunization Registry returns a positive acknowledgement message indicating that no errors were found during the course of filing the message. **Test Objectives** No Test Objectives

Test Case Group: Juana Maria Gonzales Visit

Description

Test Objectives

Infant twin, Juana Maria Gonzales Morales visits the provider where her immunization history is retrieved from the registry and reconciled with the local information in the medical record to determine vaccines that are due. Vaccinations are ordered and administered. The vaccines are reported to the immunization registry and a vaccine summary is available for the patient.

Test Case	Query the Registry for Juana Maria Gonzales.

Description

The EMR Generates a Z44 query to the Immunization Registry to retrieve the Evaluated History and Forecast for Juana Maria Gonzales. Querying the registry will consist of the vendor creating Z44 messages for Juana Maria Gonzales to be sent to the registry. The response will be processed as part of the 'Display, Reconcile, Import and Update Immunization Information' activity.

Using the Z42 Response to Immunization Registry Query, the EMR displays the Evaluated History and Forecast to the user for reconciliation and update. The vendor will receive information back from the registry and show the ability to view and reconcile, and import the information returned by the registry (NOTE: the Z42 message will be provided either manually, or as part of the tool). This test will also look at the system's ability to view the forecast returned by the registry, and create a new forecast after reconciling the information.

Test Objectives

Select New Patient: The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization

registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.

Real Time Request/Receive Patient Immunization History: The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).

Request/Receive Patient Immunization Data and Identify Source: The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

View Reconciled Immunization Forecast: The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.

Test Steps	
Select Patient Juana Maria Gonzales	**Description** Juana Maria Gonzales is selected as the patient and her record is opened in the EMR. **Test Objectives** ***Select New Patient:*** The system must allow a user to enter distinguishing information about patients so that providers can uniquely identify patients who have similar sounding names or other similar identifying information. For example, twins living in the same household will have similar dates of birth, addresses, and may have similar names. EHRs or other clinical software must be able to store information to successfully match with patients in immunization registries, if the information is available. The information includes the mother's maiden name, whether the patient was part of a multiple birth, and the order of the multiple birth. This information allows the provider to correctly identify the patient and also helps assure a match when the EHR send the patient's information to external systems such as an immunization registry.
	Description The provider uses the EMR to query the Immunization Registry for an Evaluated History and Forecast based on information known to the Immunization Registry. This query will result in an error that too many matches are found.

Query Registry for vaccination history and forecast too many matches found response	## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). Setup step to test error handling: Test the capability of the EHR-S to process a response message that returns no persons found and to provide an indication to the end user.
Error Handling - Too many matches found	## Description The EMR processes notifies the user that there were too many matches found in response to the query the Immunization Registry for an Evaluated History and Forecast. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). Tests error handling: Test the capability of the EHR-S to process a response message that returns too many matches found and to provide an indication to the end user.
Query Registry for vaccination history and forecast no persons found response	## Description The provider uses the EMR to query the Immunization Registry for an Evaluated History and Forecast based on information known to the Immunization Registry. This query will result in an error that no persons are found. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a

	pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). Tests error handling: Test the capability of the EHR-S to process a response message that returns no persons found and to provide an indication to the end user.
Error Handling - No persons found	## Description The EMR processes notifies the user that there were no persons found in response to the query the Immunization Registry for an Evaluated History and Forecast. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). Tests error handling: Test the capability of the EHR-S to process a response message that returns no persons found and to provide an indication to the end user.
Query Registry for vaccination history and forecast for Juana Maria Gonzales	## Description The provider uses the EMR to query the Immunization Registry for an Evaluated History and Forecast based on information known to the Immunization Registry. ## Test Objectives ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (QBP/RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5). ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry.

View and import response to request for vaccination history for Juana Maria Gonzales	**Description** The physician accesses the record for Juana Maria Gonzales and: - Accepts the single vaccine in the registry record into the EHR history **Test Objectives** ***Request/Receive Patient Immunization Data and Identify Source:*** The EHR or other clinical software is able to store immunization history accepted electronically from other sources (such as a public health immunization registry consistent with HL7 version 2.5.1, Implementation Guide for Immunization Messaging Release 1.5) or communicated by the patient and manually entered by the clinician. When viewing such information, the provider can determine which immunizations were administered by the practice, which were entered manually as patient-reported, and which were accepted electronically from the public health registry. ***Real Time Request/Receive Patient Immunization History:*** The system sends a request to the public health immunization registry "on demand" (e.g., those without scheduled appointments). The request includes the identifying information the immunization registry needs to match each patient with those in the registry including, if present, the mother's maiden name, a multiple birth indicator, and the birth order. The request also is sent in a pre-determined format the registry can read and interpret (Query Response Grammar (RSP) - HL7 version 2.5.1 Implementation Guide for Immunization Messaging Release 1.5).
View the vaccination forecast for Juana Maria Gonzales	**Description** The physician accesses the record for Juana Maria Gonzales and: - Views the vaccine forecast (either as provided by the Immunization Registry or as determined through EMR defined methods) **Test Objectives** ***View Reconciled Immunization Forecast:*** The EHR or other clinical software system has the ability to re-evaluate and update the immunization forecast using a patient's newly updated immunization history, where the updated forecast results from the reconciliation of immunization data contained in the public health immunization registry with immunization data contained in the EHR. Processing the new forecast can be internal to the EHR or it can use an external forecasting service.

Test Case	**Juana Maria Gonzales, Enter Orders and Immunizations**

Description

This test will consist of ordering vaccines for the test patients, reviewing any alerts caused by specific scenarios, and documenting vaccinations administered to the patients.

Test Objectives

Supporting data for error handling tests.

Record Vaccine Administration: The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.

Test Steps

Record Combo Vaccine administration	**Description** The nurse administers the the DTaP-hepatitis B and poliovirus vaccine - Documents all required information for the vaccine **Test Objectives** ***Record Vaccine Administration:*** The EHR or other clinical software system records information about each vaccine administered. The EHR records this information as structured data elements, including, at a minimum: date administered, administering clinician, site of administration (e.g., left arm), immunization type, product, lot number, manufacturer, Vaccine Information Statement date, and quantity of vaccine/dose size.

Test Case	**Juana Maria Gonzales Morales Transmit Immunization Report - Error Handling**

Description

Following the vaccinations given during the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The Vaccination report includes all newly administered vaccines. The report MAY send the immunizations that the EMR imported from the IIS.

This transaction will result in an error or warning from the IIS.

Test Objectives

Transmit Standard Patient Immunization History Report: The EHR or other clinical software system directly or

indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

Verify that the EMR is able to receive and display the error or warning response from the IIS.

Link Standard Codes to Immunization Data: The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization.
a. NDC codes, CVX for immunizations

Test Steps	
Transmit the Immunization Report for Juana Maria Gonzales Morales - Fatal Error Handling	**Description** Following the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. The report MAY send the immunizations that the EMR imported from the IIS. This will result in a warning from the IIS to assess the EMR ability to receive and display the error. **Test Objectives** ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. Setup to verify that the EMR is able to receive and display the error response from the IIS. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations
Receive ACK Z23 Fatal Error - CVX Code	**Description** The Immunization Registry returns a fatal error message indicating a table mapping error for the CVX code submitted was found during the course of filing the message. **Test Objectives** ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries.

	Error Handling Support for a fatal error returned by the IIS, and the ability of the EMR to display a notification of this error to the user.
Transmit the Immunization Report for Juana Maria Gonzales - warning handling	## Description Following the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. This will result in multiple warnings from the IIS to assess the EMR ability to receive and display the error. ## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. Set up to verify that the EMR is able to receive and display the multiple warning response from the IIS. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations
Receive ACK Z23 Warning - Invalid Value	## Description The Immunization Registry returns a warning message indicating an unrecognized administration site code submitted was found during the course of filing the message. ## Test Objectives ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. Error Handling Support for a warning returned by the IIS, and the ability of the EMR to display a notification of this warning to the user.
	## Description

Transmit the Immunization Report for Juana Maria Gonzales - Multiple warning handling	Following the visit, the EMR transmits an Immunization report to the Immunization Registry using the VXU/Z22. This will result in multiple warnings from the IIS to assess the EMR ability to receive and display the warnings. **Test Objectives** ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. Set up to verify that the EMR is able to receive and display the multiple warning response from the IIS. ***Link Standard Codes to Immunization Data:*** The EHR or other clinical software system links standard codes to discrete data elements associated with an immunization. a. NDC codes, CVX for immunizations
Receive ACK Z23 Multiple Warnings	**Description** The Immunization Registry returns a message with multiple warnings indicating unrecognized administration site codes submitted were found during the course of filing the message. **Test Objectives** ***Transmit Standard Patient Immunization History Report:*** The EHR or other clinical software system directly or indirectly through an intermediary creates and transmits a report of a patient's immunization history to public health immunization registries. Error Handling Support for multiple warnings returned by the IIS, and the ability of the EMR to display a notification of these warnings to the user.

Test Case Group: Cohort Report

Description

Test Objectives

This test will consist of generating a cohort report to list all patients who are due or overdue for immunizations showing all overdue immunizations with the associated due/overdue dates.

Test Case	Due and Overdue Immunizations

Description

The provider periodically uses the EMR to identify the cohort of patients that are due or overdue for immunizations along with their contact information in order to send reminder notifications to the patients/parents.

Test Objectives

Produce Population-Level Report: The EHR or other clinical system generates aggregate, population-level reports based on known patient immunization data.

Test Steps	
Produce Overdue Immunizations Cohort Report	**Description** The provider periodically uses the EMR to identify the cohort of patients that are due or overdue for immunizations along with their contact information in order to send reminder notifications to the patients/parents. **Test Objectives** *Produce Population-Level Report:* The EHR or other clinical system generates aggregate, population-level reports based on known patient immunization data.

Test Case Group: Review Inventory

Description

Test Objectives

Demonstrates the ability to view inventory supply, including deprecated inventory used.

Test Case	View Inventory

Description

The provider reviews the available inventory following vaccine administrations used during the day.

Test Objectives

Update Vaccine Inventory from Patient Dosage Administration: The system updates the vaccine inventory to assure the correct count of remaining available vaccine inventory.

Test Steps	
View updated vaccine inventory	## Description The provider reviews the available inventory following vaccine administrations used during the day. ## Test Objectives ***Update Vaccine Inventory from Patient Dosage Administration:*** The system updates the vaccine inventory to assure the correct count of remaining available vaccine inventory.