

Challenges in Implementing CDSC Web Service –Vendor Perspective

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Chief Medical Officer, NextGen Healthcare

Background

- Project was taken on as a proof of concept project from NextGen's perspective
- NextGen EHR/CDSC web service integration is in the final stages of development
- Client site testing with test patients has started

Overview

- Challenges faced during EHR/CDSC web service integration
- Challenges with managing dual sources of clinical decision support
- Provide details of how the CDSC web service integrates with the NextGen EHR

Terminology Challenges

- NextGen currently uses ICD-9 code for diagnoses and that is what is exported to the CCD
- CDSC required SNOMED codes
- NextGen had to perform mapping from ICD-9 to SNOMED codes using a third party product

Future Development

- Current standards widely used by vendors should be selected to minimize the need for rework or third party products
- Meaningful Use Stage 2 will require that the problem list use SNOMED so that will become the standard
- NextGen will support SNOMED in next version

Mapping Challenges

- CDSC has elected to interpret pregnancy codes more narrowly for pregnancy states
- For example
198992004 Eclampsia in pregnancy
does not represent pregnancy
BUT
90325002 Vomiting of pregnancy
represents pregnancy

Mapping Challenges

- Another example

199228009 Diabetes mellitus in the puerperium - baby delivered during previous episode of care

199226008 Diabetes mellitus in the puerperium - baby delivered during current episode of care

Neither represent DM

Mapping Challenges

- Medications in NextGen use NDC codes
- CDSC uses RxNorm
- A custom xref table was created and needs to be manually deployed to allow the xref

Mapping Challenges

- Allergies in NextGen are coded at the drug level even if classes are selected
 - Allergy classes display on CCD without codes
- Allergies in NextGen are coded using UNII
 - CDSC uses RxNorm for allergies
- First Data Bank does not provide RxNorm mapping for allergies, only drugs

Available FDB Mappings

FDB Code	RxNorm Concept
GCN_SEQNO	Semantic Clinical Drug (SCD)
GCN_SEQNO	Semantic Branded Drug (SBD)
HIC_SEQN	Ingredient (IN)
NDC	SCD
NDC	SBD
NDC	Generic Pack (GPCK)
NDC	Branded Pack (BPCK)
MEDID	SCD
MEDID	SBD
MED_NAME_ID	BN (Brand Name)

Mapping Development

- Identifying the class allergies in FDB
- Getting a copy of the NDF-RT codes for allergies
- Cross reference the FDB code to the NDF-RT code
- Implementing the logic in the interface code
- All meds will be mapped to RxNorm

Non-Codified Data Challenges

- CDSC requires foot and eye exam data
- Data is captured in structured fields but they are not codified and do not directly populate a CCD
- Protocol data are not included in the CCD
- Procedures are included in the CCD

CCD Changes

- The pregnancy information was in a CCD dedicated section rather than a subsection of the problem list.
- The patient data needed to be de-identified.

Workflow Challenges

- CDS in NextGen EHR is comprehensive & actionable
- How to best display CDSC recommendations within workflow?
- Who should see recommendations
- How to pass requests efficiently

Future Development

- Imported recommendations need to be actionable
- Duplicate recommendations need to be stripped if they are already in EHR
- More high value CDS needs to be provided
 - Radiology appropriateness indicators
 - Cardiology appropriateness indicators

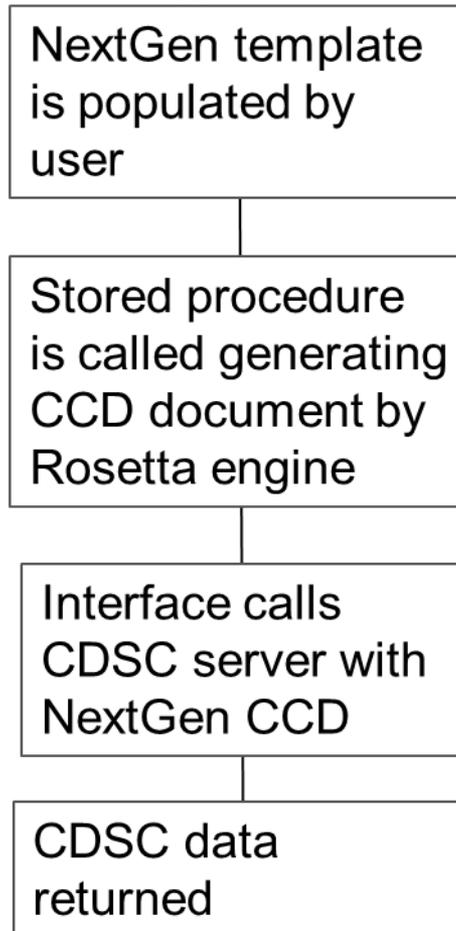
Administrative Challenges

- Multiple legal agreements
- Different time zones
- IRB approvals

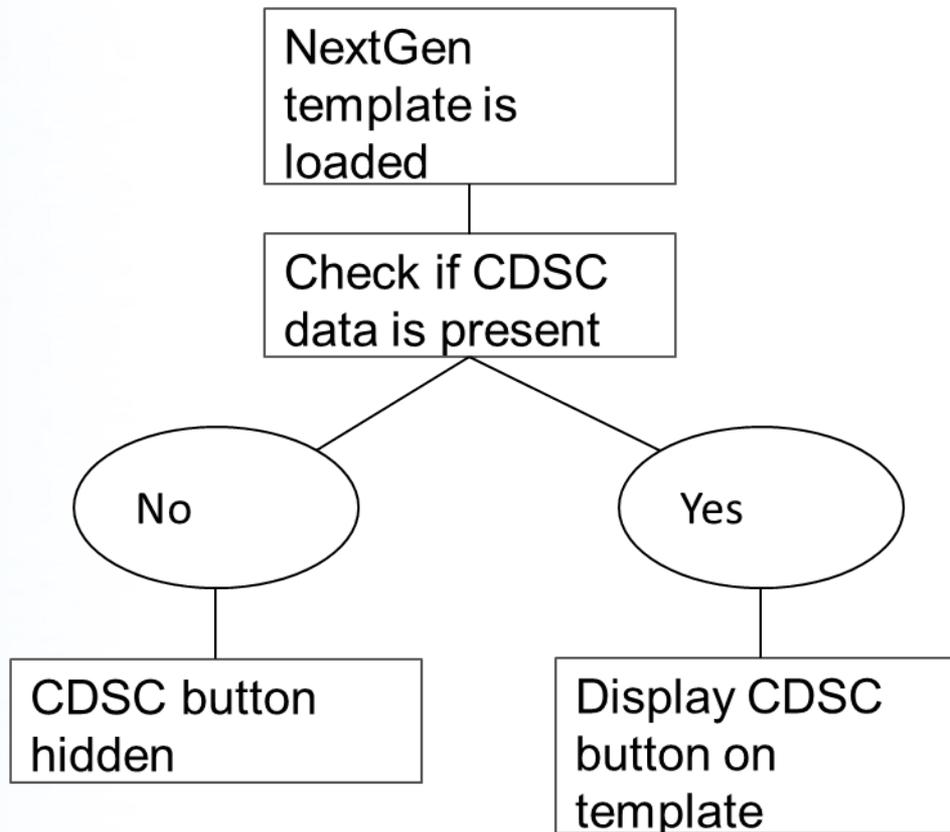


NextGen EHR/CDSC Web Service Integration Details

Schematic of NextGen/CDSC Integration



Schematic of NextGen/CDSC Integration



Screenshots

Alerts
Intake
Histories
Summary
SOAP
Finalize OV
Checkout
Protocols



New patient
 Established patient

Template set:
 Family Practice

Visit type:
 Office Visit

Historian:

[v Sticky Note](#)
[v Referring Provider](#)
[v HIPAA](#)

[v Screening Summary](#)
[v Advance Directives](#)

Vital Signs:

Unable to obtain: Refused: Add

Time	Ht Ft	Ht In	Wt Lb	BMI	BP	Pulse	Temp F	Resp	Pulse Ox	Pain Score

Chronic Problems: Add Problem

Last Addressed	Comorbidity	Code	Problem	Comments

Medications: No medications v Comment Reconcile

Medication	Sig Description
Amoxicillin 125 mg Chewable Tab	chew 2 tablet (250MG) by ORAL route every 8 hours

Allergies: No known allergies v Comment

Reviewed, no change
 Allergies added today

Allergen	Reaction

Order Type: Office services

Status	Ordered	Order	Appt Timeframe
ordered	04/26/2012	Flu (split) (3 yrs or older) #1 0.5 mL IM	2 Weeks
ordered	04/26/2012	Varicella #1 0.5 mL SC	2 Weeks
ordered	04/26/2012	MMR #1 0.5 mL SC	2 Weeks
ordered	04/26/2012	MMV (quadrivalent) #1 0.5 mL IM	2 Weeks

Reason for Visit: HPI Detail All HPIs

Review of Systems: v PHQ Update

System	Neg/Pos	Findings

v Office Diagnostics
v Lab/Radiology Order Processing
Order Management
Office Procedures
v Intake Comments
Intake Note
Tracking
Next

Screenshots

Alerts **CDS** 

Intake **Histories** **Summary** **SOAP** **Finalize OV** **Checkout** **Protocols**

New patient Established patient
 Template set: Visit type: Historian:

[v Sticky Note](#) [v Screening Summary](#)
[v Referring Provider](#) [v Advance Directives](#)
[v HIPAA](#)

Vital Signs:
 Unable to obtain: Refused: [Add](#)

Time	Ht Ft	Ht In	Wt Lb	BMI	BP	Pulse	Temp F	Resp	Pulse Ox	Pain Score
<input type="text"/>										

Reason for Visit: [HPI Detail](#) [All HPIs](#)

Chronic Problems: [Add Problem](#)

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<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>				

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Review of Systems: [v PHQ](#) [Update](#)

System	Neg/Pos	Findings
<input type="text"/> <input type="text"/> <input type="text"/>		

[v Office Diagnostics](#) [v Lab/Radiology Order Processing](#) [Order Management](#) [Office Procedures](#) [v Intake Comments](#) [Intake Note](#) [Tracking](#) [Next](#)

Diabetes Mellitus, Adult Onset, Uncontrolled

Diagnosis	Dx Code	C/T
Routine Medical Exam	V70.0	T
End stage renal disease	585.6	T
Diabetes Mellitus, Adult Onset, Uncontrolled	250.02	T

Quick assessments

Problem Focused Assessments	Code
Acute bronchitis	466.0
Adhesions, Female Pelvic	614.6
Allergic Rhinitis	477.12
Amenorrhea	626.0
Anxiety	300.09
Atrophic Vaginitis	627.3
Atrophic vaginitis	627.3

Use order set from: My saved Others saved -select a set to use

Display Order sets Protocols

Protocols due in:

Reference System: Category: Diabetes

Perform: -today

Lab orders

- 1 Hemoglobin A1c
- 2 CMP
- 3 CBC w/diff
- 4 Lipid Panel
- 5 Microalb/Creat Ratio, Randm Ur
- 6 C-Peptide, Serum

Diagnostics

[MRI/MRA Information](#)

- 1 Electrocardiogram, complete (ECG)
- 2 click arrow to choose

Office procedures

- 1 Glucose blood test
- 2 click arrow to choose

Office supplies

- 1 click arrow to choose

Pregnant: No Yes Possible Not pertinent

Instructions

My Instructions

- 1

Additional orders

Type: Select type (Required)

- 1 click arrow to choose

Office medications

- 1 Insulin injection
- 2 click arrow to choose

Office labs

- 1 Glycosylated hemoglobin assay
- 2 Lipid profile
- 3 Urinalysis, non-automated, w/scope
- 4 click arrow to choose

Follow-up visit/referral

- She is to schedule a follow-up visit
- She will be referred to
- Disposition:

Auto Tasking On

(Labs/meds/diagnostics ordered here do not upload to

[Lab/Diagnostics/Radiology Order Module Process](#)

Recommendations

Cdsc View

Close

option for treatment of fever during pregnancy.

Top

Chemoprophylaxis

1. Post-exposure antiviral chemoprophylaxis can be considered for pregnant women and women who are up to 2 weeks postpartum (including following pregnancy loss) who have had close contact with someone likely to have been infectious with influenza. *Close contact, for the purposes of this document, is defined as having cared for or lived with a person who has confirmed, probable, or suspected influenza, or having been in a setting where there was a high likelihood of contact with respiratory droplets and/or body fluids of such a person, including having talked face-to-face with a person with suspected or confirmed influenza illness.*
2. The drug of choice for chemoprophylaxis of pregnant women and women who are up to 2 weeks postpartum (including following pregnancy loss) is less clear. Zanamivir may be the preferable antiviral for chemoprophylaxis of pregnant women because of its limited systemic absorption. However, respiratory complications that may be associated with zanamivir because of its inhaled route of administration need to be considered, especially in women at risk for respiratory problems. For these women, oseltamivir is a reasonable alternative. The duration of antiviral chemoprophylaxis post-exposure is 10 days after the last known exposure. See [Table 1](#) (below) for dosing information.
3. Early treatment is an alternative to chemoprophylaxis for some pregnant and postpartum (including following pregnancy loss) women who have had contact with someone likely to have been infectious with influenza. Clinical judgment is an important factor in treatment decisions. Pregnant women and women who are up to 2 weeks postpartum (including following pregnancy loss) who are given post-exposure chemoprophylaxis should be informed that the chemoprophylaxis lowers but does not eliminate the risk of influenza and that protection stops when the medication course is stopped. Those receiving chemoprophylaxis should be encouraged to seek medical evaluation as soon as they develop a febrile respiratory illness that might indicate influenza.
4. All pregnant women should be counseled about the early signs and symptoms of influenza infection and advised to immediately call for evaluation if clinical signs or symptoms develop while these women are pregnant or are in the first two weeks after delivery or pregnancy loss.

Table 1. Antiviral medication dosing recommendations for treatment

Questions

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