Challenges in Implementing CDSC Web Service – Vendor Perspective

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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 pueperium - 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

<table>
<thead>
<tr>
<th>FDB Code</th>
<th>RxNorm Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCN_SEQNO</td>
<td>Semantic Clinical Drug (SCD)</td>
</tr>
<tr>
<td>GCN_SEQNO</td>
<td>Semantic Branded Drug (SBD)</td>
</tr>
<tr>
<td>HIC_SEQN</td>
<td>Ingredient (IN)</td>
</tr>
<tr>
<td>NDC</td>
<td>SCD</td>
</tr>
<tr>
<td>NDC</td>
<td>SBD</td>
</tr>
<tr>
<td>NDC</td>
<td>Generic Pack (GPCK)</td>
</tr>
<tr>
<td>NDC</td>
<td>Branded Pack (BPCK)</td>
</tr>
<tr>
<td>MEDID</td>
<td>SCD</td>
</tr>
<tr>
<td>MEDID</td>
<td>SBD</td>
</tr>
<tr>
<td>MED_NAME_ID</td>
<td>BN (Brand Name)</td>
</tr>
</tbody>
</table>
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

1. NextGen template is populated by user
2. Stored procedure is called generating CCD document by Rosetta engine
3. Interface calls CDSC server with NextGen CCD
4. CDSC data returned
Schematic of NextGen/CDSC Integration

- **NextGen template is loaded**
  - **Check if CDSC data is present**
    - **No**
      - CDSC button hidden
    - **Yes**
      - Display CDSC button on template
**Diabetes Mellitus, Adult Onset, Uncontrolled**

**Quick assessments**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Dx Code</th>
<th>C/T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine Medical Exam</td>
<td>V70.0</td>
<td>T</td>
</tr>
<tr>
<td>End stage renal disease</td>
<td>585.6</td>
<td>T</td>
</tr>
<tr>
<td>Diabetes Mellitus, Adult Onset, Uncontrolled</td>
<td>250.02</td>
<td>T</td>
</tr>
</tbody>
</table>

**Problem Focused Assessments**

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute bronchitis</td>
<td>466.0</td>
</tr>
<tr>
<td>Adhesions, Female Pelvic</td>
<td>614.6</td>
</tr>
<tr>
<td>Allergic Rhinitis</td>
<td>477.12</td>
</tr>
<tr>
<td>Amenorrhea</td>
<td>626.0</td>
</tr>
<tr>
<td>Anxiety</td>
<td>300.09</td>
</tr>
<tr>
<td>Atrophic Vaginitis</td>
<td>627.3</td>
</tr>
<tr>
<td>Atrophic vaginitis</td>
<td>627.3</td>
</tr>
</tbody>
</table>

**Perform:**
- **Reference System:** custom_impression
- **Category:** Diabetes

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

**Diagnostics**
- **MRI/MRA Information**

**Office procedures**
- 1. **Clear**

**Office supplies**
- 1. **Click arrow to choose**

**Office medications**
- 1. **Insulin injection**

**Office labs**
- 1. **Glycosylated hemoglobin assay**
- 2. **Lipid profile**
- 3. **Urinalysis, non-automated, w/scope**

**Instructions**
- **Clear**

**Additional orders**
- **Clear**
- **Type:** Select type

**Follow-up visit/referral**
- She is to schedule a follow-up visit
- She will be referred to

**Disposition:**
- **Task**

**Assign order set from:**
- My saved
- Others saved

**Display**
- **Order sets**
- Protocols due in 3 Months

**Pregnant:**
- No

**Save & Close**
Recommendations

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 close 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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