**ONC – Sharable CDS Project**

**CDS Sharing Structure - Description Form and Example**

**March 30, 2012**

Please take as much space as you need for your responses for the description form.

Don’t forget to provide the CDS examples listed at the end of this document, below the structure-description table.

Please return by EOB Tuesday 4/3/2012.

***Clarifying note:*** We have replaced the term “clinical decision support rule” used in the 2011 Edition EHR certification criteria and the HITSC recommended criterion with the term “clinical decision support intervention” to better align with, and clearly allow for, the variety of decision support mechanisms available that help improve clinical performance and outcomes. A CDS intervention is not simply an alert, notification, or explicit care suggestion. Rather, it should be more broadly interpreted as the user-facing representation of evidence-based clinical guidance. Our goal in clarifying the nomenclature is to focus more on the representation of the guidance (the CDS intervention) that the EHR technology should offer to the user rather than prescribe the form of either the logical representation of the clinical guidance or how the intervention interacts with the user.

1. **CDS Structure Description**

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| --- | --- | --- |
|  | Example | Your responses |
| **Your name** |  | Aziz Boxwala, Blackford Middleton, Tonya Hongsermeier |
| **Name of your model or project** |  | CDS Consortium and Advancing CDS projects |
| **Major function or purpose** | To improve readability and precision of guidelines; to provide downloadable or copyable interventions; to provide a remote CDS service | Provide a framework for translating evidence-based recommendations into executable CDS interventions in multiple modalities |
| **Primary conventions, toolkits, rules engines, data standards** | DROOLS, Arden, GEM | XML, GELLO for knowledge representation |
| **Active use by (vendors, agencies)** | Allscripts SCM; American College of Cardiology; NQF | Partners Healthcare, Regenstrief, UMDNJ, University of Oslo |
| **Number of interventions/rules built** |  | More than 30 |
| **How is it expressed?** |  | We use a multilayered framework for translating recommendations into executable CDS. Within this framework, the structured recommendations layer (known also as L3), provides a unified model for representing knowledge for multiple intervention types (called CDS modalities) |
| * XML version available? |  | Yes |
| * Pseudo-code? |  | We use GELLO for specifying the logic, though pseudocode is usable too |
| * Other coded format |  | GELLO for logic, Standard terminologies and value sets |
| * Human-readable format |  | Yes, XML in L2 or L3 can be rendered with stylesheets |
| * Other (describe) |  |  |
| **CDS Process Steps that are expressed in your model** | *(Only fill in information for the steps that your model directly supports)* |  |
| - Triggering | Event, data filing, absolute time, relative time since event, manual, other. State which of these are supported and describe | The knowledge representation model uses a code set to identify the trigger type – so all of these trigger types are supportable. |
| - Logic | Calculations necessary to guide whether, and how, information is to be presented or filed or actions taken. Describe method | Logic statements in the knowledge representation scheme are expressed in GELLO. |
| - Access to Input Data | How input data is accepted, whether generic or installation-specific | The knowledge representation scheme models patient data in a format consistent with the clinical statements in CCD. |
| * Classes of data supported | Lab tests, physical findings, diagnoses, procedures, text, orders, etc. (which standards)? | See attached model in Section 3. |
| - Use of Value sets | How these are defined, used | Value sets are defined in the knowledge representation scheme as a special data type. They are used in logical expressions to check if patient data intersect with a value set |
| - Notification and acknowledgement, if any | Is notification supported (e.g., sending messages, email, status display) | Notification is supported. Acknowledgment of user responses to notifications is supported though a challenge has been the lack of a standard set of acknowledgment codes. |
| * Intervention | Intervention types directly supported (i.e., you specify the core elements – for an alert, this might be an informational message, presentation of some data, and offered actions). Specify which types. See below for list. | See table below |
| * + Reminders and Alerts | Describe core elements in one supported intervention type and how they are represented | Metadata  Behavior: Trigger  Behavior: Applicable Scenario (modeled as a logical expression in GELLO)  Action: See action model in Section 4  Presentation: Ordering of actions |
| * + Infobuttons |  | Metadata  Behavior: Applicable Scenario (modeled as context)  Action: Knowledge asset request |
| * + Order Set |  | Metadata  Behavior: Trigger (optional)  Behavior: Applicable Scenario (optional)  Behavior: Interactions amongst order items (select 1-of-n items, consequent actions)  Actions: Individual order items based on model in Section 4  Presentation: grouping of order items under different headers |
| - Offered user actions | Actions the user can take are directly supported, such as documentation, adding/deleting an order, posting acknowledgement, documenting exceptions. Specify which kinds | The model supports sending messages and providing actionable CDS, e.g., ordering a lab, prescribing a medication, altering a proposed action. See attached model is Section 4. |

Standard list of intervention types, for reference:

1. -Immediate critiques and warnings (e.g., in response to an order – “immediate alerts”)
2. -Event-driven or time-driven alerts and reminders (not in response to an order)
3. -Relevant data summary displays for a patient’s conditions/events
4. -Orders/order sets/care plans
5. -Parameter guidance (usually within ordering)
6. -Smart documentation templates
7. -Filtered reference information and knowledge resources (including infobuttons)
8. -Diagnostic advice or expert workup guidance
9. -Analytic calculations

See also associated document on Unified CDS Model

|  |  |
| --- | --- |
| **Modality/Intervention Type** | **Development progress** |
| Immediate critiques and warnings (e.g., in response to an order – “immediate alerts”) | Needs minor work on modeling trigger taxonomy |
| Event-driven or time-driven alerts and reminders | Needs minor work on modeling trigger taxonomy |
| Relevant data summary displays for a patient’s conditions/events | Near completion |
| Orders/order sets and care plans | Completed – see example below |
| Parameter guidance (usually within ordering) | In progress |
| Smart documentation templates | Not started |
| Filtered reference information and knowledge resources | Completed – see example below |
| Diagnostic advice or expert workup guidance | Not considered for diagnostic advice |
| Analytic calculations | In progress |

1. **CDS Structure Examples:**

Show how your method / structure / format is used to its fullest to handle the following two CDS situations, based on Stage 1 Meaningful Use quality measures. Describe how you fulfill the elements above, e.g., triggering, access to data, logic, intervention, offered actions.

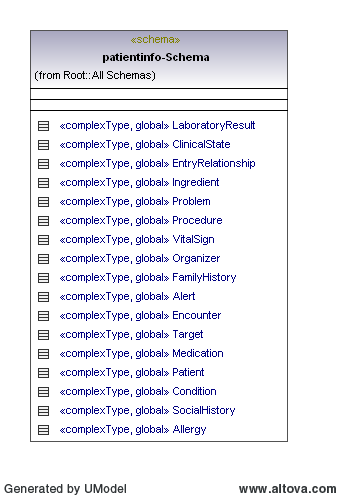
1. Ambulatory chronic care: Hemoglobin A1c in diabetes– done in timely fashion, recognize/deal with high values

See included file Diabetes-HbA1c-Reminder.xml. This illustrates a reminder for HbA1c in uncontrolled diabetes in CDSC version 3 schema. It uses GELLO as the expression language and data mapping language.

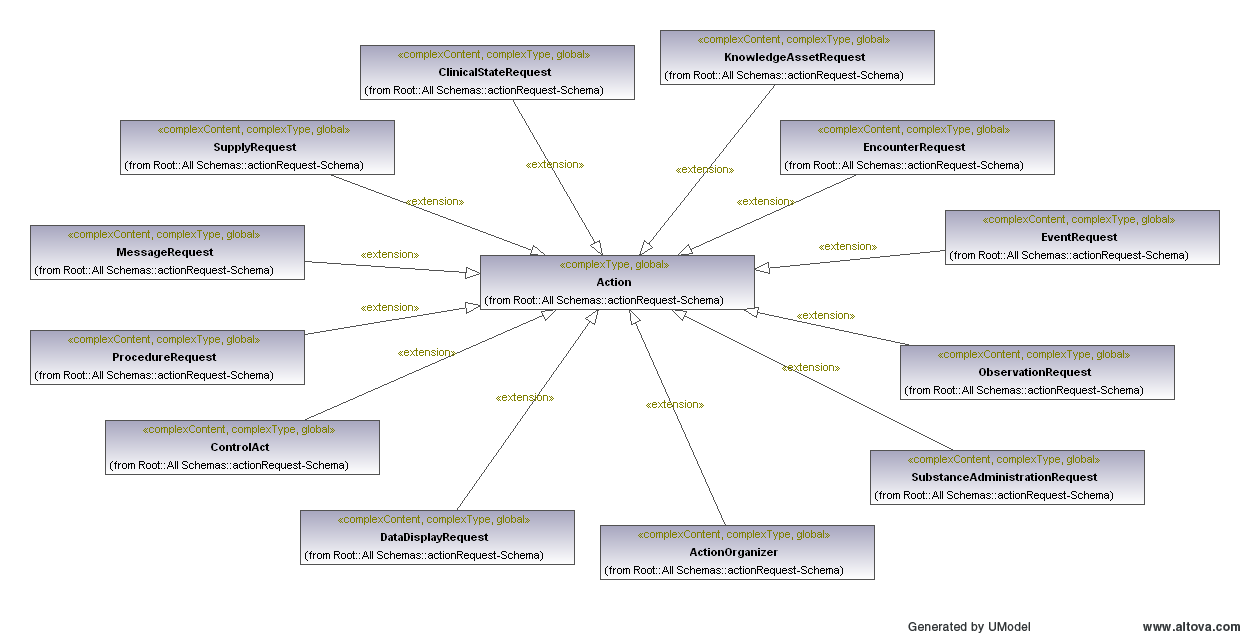
1. Inpatient care: VTE prophylaxis for appropriate patients after admission

See included file OrderSetForVTE\_Inpatient-L3v3.xml . This illustrates an order set configured using the CDSC version 3 schema for structured CDS knowledge. Instead of GELLO, it used pseudocode for the expressions.

1. **Patient Data Model**

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1. **Action Model**

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