TRIM to CDA

prepared by  
Lantana Consulting Group

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# Introduction

## Purpose

The purpose of this document is to provide a high level feasibility analysis of extracting TRANSCEND/Tolven data to create a valid CDA R2 report, so the information can be shared through the caCIS integration platform.

## Approach

TRANSCEND uses RIM-based Templates (TRIM) format to specify data structures and relationships to be implemented in data repository. Overall, the approach taken here is to perform a high level TRANSCEND TRIM data categorization analysis based on healthcare domains (such as diagnosis, patient demographic data, medication, procedure, social history, etc.), then compare the categorized TRANSCEND data set with CCD's summary report sections for the purpose of generating CCD file, with HITSP C32 clinical report content module for the purpose of generating CDA file, and provides a few TRANSCEND/Trim to CDA mapping examples, and then concludes on the feasibility of using CDA to support TRANSCEND data sharing through caCIS integration platform.

## Organization of This Document

This document contains following sections:

1. Introduction
2. TRANSCEND TRIM Data Analysis
3. High Level TRANSCEND TRIM Data and CDA/CCD Mapping
4. Discussions
5. Conclusions

# TRANSCEND TRIM Data Analysis

The TRANSCEND TRIM has a broad data spectrum. The data can be categorized into multiple groups regarding clinical context, and shared common attributes.

* Patient Demographic Data

Example: patient demographic data such as name, DOB, address, race, ethnicity (registration.trim.xml, registrationInfoTemplate.trim.xml)

* General Clinical Data

Example: allergy and adverse reaction (baselineAE.trim.xml), diagnosis (baselineDiagnosisTemplate.trim.xml), medication (baselineMedicationTemplate.trim.xml), clincial findings (clinicalFindingTemplate.trim.xml), clinical physical exam (clinicalPE.trim.xml), clinical review of system (clinicalROSTemplate.trim.xml), family history (baselineFamilyHistoryTemplate.trim.xml), lab examination (labAndTest.trim.xml) etc.

* Cancer Care Particular Data

Example: cancer staging (clinicalStaging.trim.xml), lymph node location (lymphNodeLocationVS.trim.xml), chemotherapy treatment (chemoTreatment.trim.xml) specimen related procedures (clinicalStagingBiopsyTemplate.trim.xml), cancer pateint follow up (followUp.trim.xml), clinical toxicity (clinicalToxicityTemplate.trim.xml), etc.

* Summary Report

Example: comprehensive cancer patient summary report, which includes broad information of interest to cancer care community (baselineNote.trim.xml); specific report focusing on a particular clinical subject such as chemotherapy summary (chemoSummary.trim.xml)

TRIM Template data issues: during the preliminary analysis, we found following TRIM template design issues, these issues need to be addressed or clarified with accompanied documentation in the course of TRIM-CDA mapping.

* Clinical concept was represented in TRIM template; but TRIM templates are not well designed and organized to achieve the most template reusability
* Template specification was mixed with both class definition and actual class instance
* Template contains irrelevant content, ambiguous data representation, lacking of form data definition.
* Template does not specify levels of data strength such as "required", "required if know", "optional" etc.

(*NOTE: this is not a complete list*)

|  |  |
| --- | --- |
| **TRIM DATA** | **Description** |
| baselineAE | defines allergy and adverse event |
| baselineDrug | less drug, more about drug caused allergy with action, and severity |
| baselineDiagnosis | define diagnosis in general |
| clinicalImpression | defines impression diagnosis - staging, status, participant physician |
| baselineBreastCancerDiagnosis | defines breast cancer diagnosis |
| baselineBreastCancerSurgeries | defines breast cancer surgery procedure |
| baselineFamilyHistory | cancer centered family history |
| baselineMedication | defines medication in general |
| clinicalChemoMedication | defines medication specific for chemotherapy |
| clinicalMedication | defines clinical medication (dose, route, frequency), overlap with baselineMedication |
| regimen | similar to medication template, defines chemo regimen |
| baselineXRT | defines cancer radiation therapy |
| bloodSpecimen | defines blood specimen with patient info, patient consent, specimen type, shipping info |
| coreSpecimen | defines general specimen (contains noises which are not related to specimen) |
| chemoTreatment | defines chemo treatment with circle number, regimen (medication template) |
| clinicalFinding | defines clinical finding with attributes laterality, abnormality, size, quality, mobility, Clinical suspicion, biopsy, image correlation |
| clinicalPE | defines physical exam |
| clincalROS | defines review of system |
| clinicalStaging | defines clinical staging with all supporting evidence from broad data elements |
| commonToxicity | defines toxicity in general |
| clinicalToxicity | defines clinical toxicity - type, status, patient compliant, question/answer pertinent to clinical toxicity |
| baselineNote | similar to summary report; it contains broad information including patient demographic, encounter, procedure, vital sign, risk factor, physical review etc. |
| chemoSummary | a chemo summary report; contains regimen, treatment end reason |

# High Level TRANSCEND TRIM Data and CDA/CCD Mapping

CCD is a summary document specification, derived from CDA r2. It contains document header and document body parts. The CCD document header contains patient demographic, encounter, care participation, and document meta data. The CCD body contains following options sections:

Payers, Advance Directive, Support, Functional Status, Problems, Family History, Social History, Alerts, Medications, Medical Equipment, Immunization, Vital Signs, Results, Procedures, Encounters, Plan of Care.

From preliminary TRIM data analysis, TRANSCEND persisted general clinical data content and some cancer particular data content can fit into corresponding CCD sections as partially illustrated below:

|  |  |
| --- | --- |
| **TRIM** | **CCD** |
| Patient demographic data | Header |
| Diagnosis data | Problems section |
| Medication data | Medication section |
| Lab test data | Result section |
| Physical Example, Review of System, Vital Sign | Functional Status and Vital Sign section |
| Family history | Family History section |
| Procedures related to cancer care, specimen collection | Procedure section |
| Cancer patient follow up plan | Plan of care section |

For some cancer care particular data content, such as comprehensive specimen information, staging information, toxicity information, CCD does not have defined sections to convey the information. To address data exchange need in CDA format, there are two options (*Note: based upon review/discussion, there may be more options*):

1. Extending CCD by adding additional sections to support extra cancer care related information. CCD is an open document specification, additional sections can be added as long as these sections comply with CDA r2. Receiving system can optionally choose to only process CCD defined sections, or also process additional sections.
2. Not extending CCD, but creating a list of CDA documents. These CDA documents should serve various cancer information consuming needs demanded by EHR systems. These CDA documents can either be subject specific (such as Clinical Staging CDA document, Surgical Note CDA document) or general summary (such as Baseline Note CDA document)

What option we take, or we may take a solution of combining these two options will rely upon both NCI and external EHR data requirement.

## 

# Mapping methodology

We suggest adopting the "Templated CDA" methodology for TRANSCEND TRIM and CDA mapping.

TRANSCEND TRIM defines hundreds clinical or admin data elements. These data elements are represented in proprietary format (TRIM); The TRANSCEND TRIM templates are not designed to achieve maximum template reusability. Both create barriers to effective information interoperability for internal and external data exchange.

CDA templates, in contrast, are structured, patterned representations, in a common formalism supporting discovery and reuse. CDA templates are modular, reusable building blocks, layered on top of the base CDA standard. The templates enable the semantic representation of a wide variety of data elements, under a wide variety of scenarios. As model-driven computable objects, they can be manipulated via a wide variety of automated processes.

Steps to take

1. TRANSCEND TRIM data content analysis
   1. Categorizing individual data elements into groups with common clinical context, and common attributes
   2. Consolidating redundant, repeatedly TRIM templates to derive a small number of TRIM templates as source data format for mapping.
   3. Performing data requirement analysis to prioritize data elements, planning on multi phase based data extraction from TRANSCEND to CDA rather than a one-time, all data extraction.
2. CDA/CCD Template Library Construction
   1. Based upon the #1, browsing and identifying existing CCD, HITSPT C83 templates that meet TRIM data element needs. These standard templates will be added to the TRANSCEND CDA Template Library.
   2. Developing new CDA template for TRIM data wherever there is no precedent standard based template exist. These new template will be added to the TRANSCEND CDA Template Library
   3. Mapping TRIM data class to CDA template. Such mapping can be reuse across all TRIM template wherever the same data element present.
   4. Publishing TRANSCEND CDA implementation guide including the CDA template definition, which will guide document exchange partners to correctly, efficiently develop CDA document consuming services.

# Conclusions

From the preliminary analysis, assembling abstracted TRANSCEND data into CDA/CCD is highly feasible. Concrete CDA, CCD section content design will based on in-depth TRIM data analysis, and prioritized content requirement. We recommend taking the "templated CDA" approach, planning on multiple phases, with the focus to address most critical information sharing requirement for the current phase.

# References

1. Acronyms and Abbreviations

CCD Continuity of Care Document

CDA Clinical Document Architecture

HL7 Health Level Seven

RIM Reference Information Model

RMIM Refined Message Information Model

XML Extensible Mark-up Language