HEALTH STORY | PROJECT

Integrating Narrative Notes and the EHR

Health Story: The Gentle Path to Meaningful Use

Introduction

The Health Story Project is an industry collaborative working to accelerate the integration of the full "health story" into the electronic health record (EHR) using the HL7 Clinical Document Architecture (CDA). Health Story CDA documents help meet Meaningful Use criteria because they leverage existing communication networks and workflow to populate the EHR from primary sources. *Much of the source information is necessarily narrative, even where structured data entry is an option.* In narrative as in structured entry, the data elements required for Meaningful Use are present and can be coded and safely replicated in the patient record.

The Status Quo

Over a billion clinical notes are created by physicians in the U.S. each year. These notes contain the lion's share of the clinical record and will continue to do so, even with Electronic Health Record (EHR) system adoption. These notes document procedures, operations, consultations, diagnostic imaging, discharge summaries and more. They also contain findings that are critical for compliance with the Final Rule from the U.S. Department of Health and Human Services for Meaningful Use of EHR systems (Meaningful Use), and they supply critical context for the data elements.

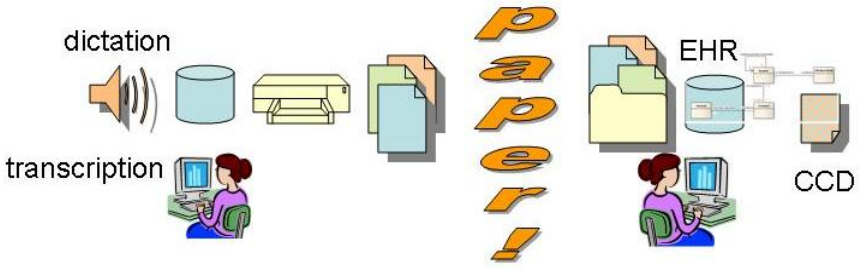

Figure 1: Current Workflow: Redundant keyboarding, paper transmission

Most of this rich store of information is not available within the EHR unless it is rekeyed referencing a printed or faxed copy of the note or keyboarded, sometimes by physicians. Yet today, transcription and clinical documentation vendors routinely dumb down their source data delivery because EHRs cannot accept it, even when it is coded to a national, industry standard. *Although the source document contains discrete, standards-coded, Meaningful-Use-compliant data,* most EHRs are not capable of pulling it in. Today, EHRs are still treating dictated notes as if they were paper, even when, as is increasingly the case, the notes have a rich electronic source

format that can readily comply with industry standards, including standards for Meaningful Use.

Most transcription and clinical documentation firms today use Extensible Markup Language (XML) in their systems because the consistent structure of an XML document creates efficiencies in their production process,[1] and many use some form of HL7 Version 2.x messaging to manage document workflow, either results or medical records messages. These two components, a consistent XML structure and industry standard metadata, are sufficient to support automated transformation to a basic CDA note because the CDA header is designed for compatibility with these messages, and the CDA body can be very basic XML.

And yet, transcription and clinical documentation vendors routinely suppress the business intelligence in their documents – stripping out the XML and the coded metadata – for delivery. What a waste! With Meaningful Use, we now have a strong incentive to mine this information and pull it into the EHR to support compliance.

Health Story

Health Story (www.healthstory.com) was founded in 2007 to open the gateway between dictated notes and the EHR. The project has two agendas – 1) support development of the industry standards needed to move information from notes into the EHR and 2) promote the adoption of these standards. The project uses volunteers and contributions from members to support development of specifications for electronic documents donating all intellectual property to the HL7 International standards development organization (SDO) and following HL7 policies for participation, ballot and publication. Participation in development of the specification is open to all. This tandem arrangement, a group with a direct tie to industry requirements and a desire to accelerate standards development teaming up with an established SDO, is often referred to as agile standards development.[2] The HL7/Health Story Associate Charter agreement has produced technical implementation guides for eight common clinical documents within three years, several of which were recommended by adoption under HITSP.[3]

How it Works (and the limits)

XML alone, which is already used by most transcription companies, is not sufficient to make data ready for EHR consumption. The HL7 CDA is a standard application of XML that spells out what tags can/cannot be used, for example, using <title> for the display title of the document. In addition, CDA accommodates semantic markup which makes the text computable for an EHR. The specification requires, for example, that the <code> element in the document header contain one of a restricted list of codes that describe what type of document it is (e.g. History & Physical, Consult, etc.).

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[1] Based on personal interviews with large and small transcription and clinical documentation vendors and informal survey of Health Story members. According to interviews, XML for transcription, "provides the richness of a database with the simplicity of a portable document."

[2] The concept of "agile" applied to standards development is well documented here: http://www.starstandard.org/STAR/XML2006?action=downloadman&upname=AgileXMLDevelopment.pdf. See also the Kantara Initiative, especially UMA, for a description of its use in some security and confidentiality (http://kantarainitiative.org/confluence/display/uma/Charter)

[3] http://www.healthstory.com/standards/standards.htm

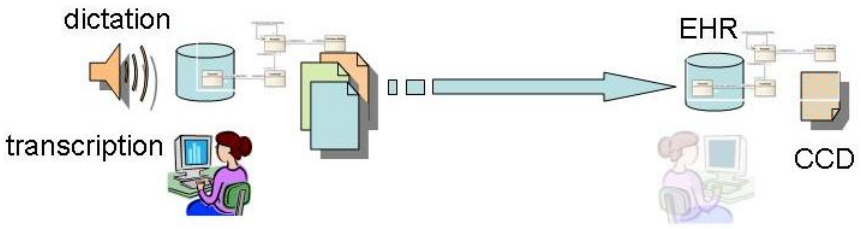

Figure 2: Health Story documents into EHR as CCD source

By design, Health Story follows the coding patterns and conventions used within the HL7 Continuity of Care Document (CCD). These patterns are called CDA templates, and the overarching strategy is called "templated CDA." The strategy underlies use of the CCD for transfer of care summaries, C32, as stipulated for Meaningful Use, and the Health Story implementation guides for History & Physical, Consult, etc., which can pump the source data into the EHR from dictated notes as indicated in Figure 2.

Consider, for example, the Meaningful Use requirement to supply a Discharge Summary and to maintain a medication list within the EHR. A dictated, Health Story-compliant note with structured data entries will contain the same medication template as the CCD and meet the need for a Discharge Summary.

Figure 3 shows the note in a web browser and a fragment of the underlying coded entries. Note the use of the CCD Medications template and also that the text fragment on prior medication for adrenal insufficiency is structured as a simple paragraph, like HTML.

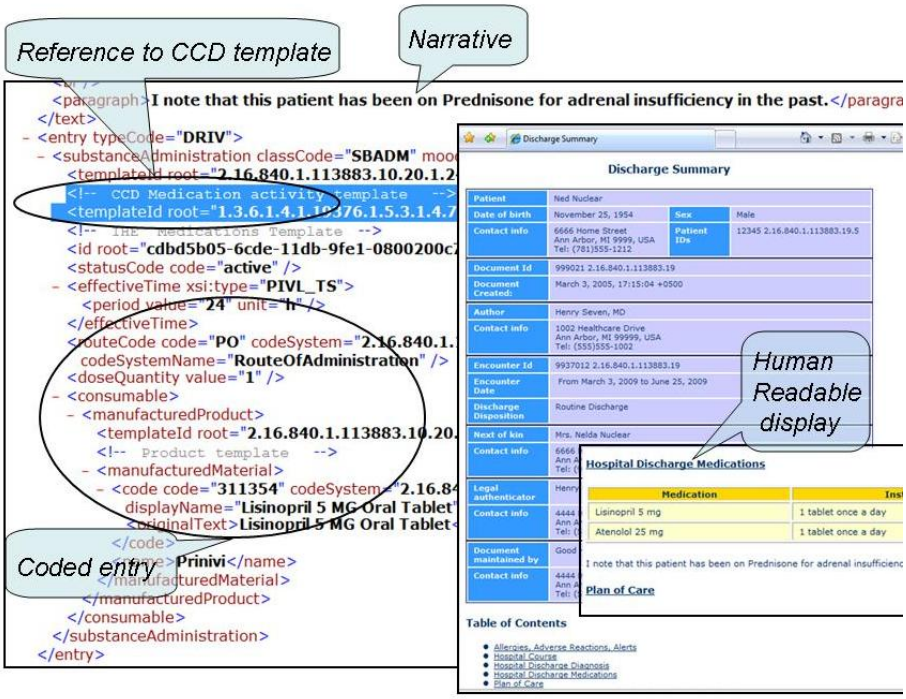

Figure 3:
Hospital Discharge Medications in an HL7 Discharge Summary, using the CCD medication template[4]

[4] Officially known as the "HL7 Implementation Guide for CDA Release 2: Care Record Summary, Release 2; Discharge Summary, Release 1", it is compatible with IHE Patient Care and is available here: http://www.hl7.org/documentcenter/ballots/2009SEP/downloads/CDAR2_IG_CRSR2_DS_R1_DSTU_2009DEC.zip

How does a dictated note acquire codes?

A basic CDA note can be a straightforward, automated transform from the current HL7 version 2, XML and word processing formats in use and can contain discrete data for provider, patient, type of document, date of encounter – the basic who, what, when, why, where of the note – and coded sections indicating which sections are present (e.g. Chief Complaint, Current Medications, etc.). *Any* dictated note can be delivered with this level of utility with a no-cost or minimal cost enhancement from the service provider – they couldn't produce the notes without this level of structure and semantics.

There are multiple methods to enrich dictated notes with detailed coded entries, sometimes called "discrete reportable transcription."[5] Computer assisted coding (CAC) is already familiar to many, has been the subject of AHIMA workshops for several years and underlies route use of narrative to support reimbursement. CAC is implemented with various levels of automation making coders more productive.

Natural language processing (NLP) is a mature and implemented technology for clinical notes. The XML structure and the minimum CDA markup make accurate NLP easier to achieve. Most implementations provide a review function to ensure accurate encoding, and the cycle is integrated into the usual review for signature.

Other applications support dictation within a tightly constrained data capture template that provides the semantic structure needed for coding. And yet other approaches use mobile and smart phone technology to push prompts to the dictating physician to support narrative and structured entry through dictation.

While many methods of creating discrete entries are in use, it is the application of the standard HL7 CDA markup that makes the entries usable within an EHR that is primed to accept and produce the CDA because of the Meaningful Use requirement. Without the common standard, no EHR vendor could be reasonably expected to build an interface to accept coded electronic documents because they would be required to build a custom interface for every supplier.

Tackling the limits

Accepting that we are within easy reach of structured and coded output from transcription/clinical documentation, there are still major barriers to leveraging this data for Meaningful Use, and these include the ability of EHR systems to accept and integrate this data. This gap has been bridged in custom integrations[6] and by major EHR vendors,[7] but it is not yet mainstream.

The Meaningful Use criteria offer strong incentive to leverage this available data. Structured and coded data from electronic documents are the single most enticing piece of low hanging fruit - let's harvest it.

Providers can begin taking advantage of the Health Story path to Meaningful Use by asking their transcription/clinical documentation vendors to pass along the benefits of the structure they are already building into the notes (and for which providers are already paying), to start communicating the value of keeping this structure available to the providers through delivery of structured text, and to let them leverage the information within their EHRs. The benefits to providers are fast, non-disruptive data

[5] http://www.acgroup.org/images/2009-02_What_is_DRT.pdf
[6] "An Electronic Health Record Based on Structured Narrative", Stephen B. Johnson, PhD, Suzanne Bakken, RN, DNSc, et al, **J Am Med Inform Assoc.** 2008;15:54–64. DOI 10.1197/jamia.M2131.
[7] Health Story is developing a series of case studies. Currently, there is no published account of this type of integration outside of commercially-developed literature.

entry with a defined pathway to meeting Meaningful Use criteria. To get started, see the sample language for transcription and EHR system procurement on the Health Story web site,[8] and speak to your EHR vendor about the steps needed to open up this gateway.

Beyond Stage 1: Getting the full Health Story

The templated CDA approach means that by design, the coded components within Health Story compliant documents meet Meaningful Use requirements. The following table shows where within each of the HL7 Health Story Implementation Guides are found the required data elements for Meaningful Use Stage 1:

	Document Types									Other
CDA Templates	CCD C32	Discharge Summary	Consult Note (HITSP C84)	History & Physical (HITSP C84)	Operative Note (HITSP C166)	Diagnostic Imaging Report	Procedure Note	Unstructured Documents	Progress Note	Described in HITSP C83
CDA Header										
Personal Information (header template)	√	√	√	√	√	√	√	√	√	
Information Source (header template)	√	√	√	√	√	√	√	√	√	
Language Spoken (header template)	√	√	√	√	√	√	√	√	√	
Medication/Immunization Category										
Medications Section	√		√	√			√	*	√	√
Hospital Discharge Medications Section		√						*		√
Immunizations Section	√	√	√	√				*		√
Condition/Concern Category										
Allergies and Other Adverse Reactions Section	√	√	√	√			√	*	√	√
Problem List Section	√	√		√				*	√	√
Active Problems Section			√					*		
Procedure and Surgery Category										
List of Surgeries (History of Procedures) Section	√	√	√				√	*		√
Care Planning/Assessment Category										
Assessment and Plan Section				√			√	*	√	√
Plan of Care Section	√	√	√		√			*		√
Results Category										
Diagnostic Results Section	√		√	√				*	√	√
Vital Signs Section	√	√	√	√	√			*	√	√
Other Templates										
Advance Directives Section	√		√					*		√
Hospital Course Section		√						*		√
Social History Section	√	√	√	√			√	*		√

Document sections required for ARRA HITECH Stage 1 certification and Meaningful Use
Required to be **collected** in the EHR, but are **not** required in Stage 1 Clinical **Summaries**
* = all clinical content

Table 1: Meaningful Use Templates in CCD and Health Story Documents[9]

Stage 2 will require a broader set of clinical data elements. One approach is to wait until the data elements are identified and ensure that they can be captured and encoded. A forward-looking and extensible approach is to ensure that the full "story" is available now in standard form. The advantages go beyond the particulars of certification – they include access to the full clinical record in the nuanced, precise language in which it was captured.

[8] http://www.healthstory.com/standards/sec/require.htm

[9] This is an excerpt from a more extensive comparison prepared by the EHR Association with assistance from Health Story. It is in use supporting the ONC Consolidation Project and can be accessed here: http://jira.siframework.org/wiki/display/SIF/Comparison+of+CDA-Based+Documents