Ensuring Value in the Electronic Clinical Record

Liora Alschuler, CEO

HIMSS Health Story Project:
Ensuring Value in the Electronic Clinical Record

Presented at New England HIMSS

1st Vermont & New Hampshire Annual Fall Event

October 11, 2013

Lebanon, New Hampshire

HiMSS
transforming healthcare through IT

About Me

- Background in electronic text, how to make large amounts of information usable on a computer

- As a volunteer have helped to
  - Bring XML to healthcare exchange standards
  - Develop the CDA, CCD, Consolidated CDA
  - Co-found the Health Story Project

- Current day job as Lantana CEO
  - Support standards development and deployment
  - Manage staff for virtual company of about 40 FTEs
  - Approve all menus for company dinners
  - Bring groups to the Upper Valley on any excuse I can find
  - Participate in the CDA Academy (www.cdaacademy.com)

1. **Challenge & Response**

2. Background: 2006 to 2013

3. The "How": Just enough about standards

4. Present & Future: Technology & Policy

Challenge

VIEWPOINT

The Challenge to the Medical Record

JAMA, Internal Medicine, published online, May 27, 2013

Robert S. Foote, MD
Department of Nuclear Cardiology, Dartmouth Hitchcock Medical Center, Lebanon, New Hampshire., and Department of Medicine and Radiology, Geisel School of Medicine at Dartmouth, Hanover, New Hampshire.

Observe, record, tabulate, communicate.

Sir William Osler

Thirty years ago, not long after I began teaching first- and second-year medical students how to take patient medical histories and perform physical examinations, it occurred to me that I was trying to teach them how to write. I came to see that taking a medical history, performing...

uted have become more and more inscrutable, it has spawned a small army of people who "need" to know what happened in the examination room or at the bedside. They need to know because their livelihoods and the functioning of the system as a whole depend on it. This group includes administrators, policy makers, coders, support staff, information technologists, business groups, and government agencies, among many oth-

"I have never seen…a checkbox for apprehension…

"The medical record is not data. It contains data… but it is not data, nor is it simply a repository into which data are poured.

"... [it is] information that has been transformed by the knowledge, skill, and experience of the physician…into an understanding of human experience…"

HIMSS transforming healthcare through IT

Lantana CONSULTING GROUP

Data from clinical notes: a perspective on the tension between structure and flexible documentation

S Trent Rosenbloom, Joshua C Denny, Hua Xu, Nancy Lorenzi, William W Stead, Kevin B Johnson

Department of Biomedical Informatics, Vanderbilt University Medical Center, Nashville, Tennessee, USA

Correspondence to
Dr S Trent Rosenbloom, Eskind Biomedical Library, Room 440, 2209 Garland Avenue, Nashville, TN 37232-8340, USA; trent.rosenbloom@vanderbilt.edu

ABSTRACT
Clinical documentation is central to patient care. The success of electronic health record system adoption may depend on how well such systems support clinical documentation. A major g_ _ _ f i_ _ _ _ _ _ _ _ _ _ _ _ _ _
documentation into electr_ _ _ _ _ _ _ _ _ _ _ _
to generate reusable data_ _ _ _ _ _ _ _ _ _ _ _ _
an emphasis on deploying_ _ _ _ _ _ _ _ _ _ _ _ _
documentation systems t_ _ _ _ _ _ _ _ _ _ _ _ _
documentation. Research_ _ _ _ _ _ _ _ _ _ _ _ _

documentation (CBD) systems that promote real-time structured clinical documentation.
The myriad requirements imposed on clinical documentation compel healthcare providers to _

Structured data capture can be at odds with the expressivity, workflow, and usability factors preferred by clinicians.

Authors recommend *choice* in data capture and text processing modalities.

Challenge

American College of Physicians, Board of Regents

- **Resolution Endorsing and Promoting a Method of Documentation to Improve Communications with the Electronic Medical Record**

- Spring, 2013, A resolution endorsing and promoting

    - EMR documentation "that emphasizes the thought process underlying decision making, patient complexity, and medical necessity …

    - "with clarity and without requiring repetition of past notes, tests and extraneous data."

American Medical Association Board Chair

- **HHS Should Address EHR Usability Issues Immediately**

- May 15, 2013, AMA Wire

    - Report on testimony noting that physician dissatisfaction with EHR systems has increased,

    - Urging greater flexibility in meaningful use while systems are improved.

Challenge

Struck, Rhonda, DNP, RN

- **Telling the patient's story with electronic health records**
- Nursing Management, July 2013
- Addresses
  - sense of loss of narrative in fragmented EHRs and
  - how to remediate via a comprehensive, cross-disciplinary patient portal.

Lawrence B. Marks, MD

- **Misperceptions on electronic health records**
- &Newsobserver.com, October 4, 2013
  - "During any evaluation, I like to scan the prior notes to remind myself of how the patient has been doing over the last few weeks. ...with a paper chart, …it was almost like reading a short story.
  - "Imagine reading a short story and being allowed to view only one paragraph at a time. Imagine needing to open or close multiple windows to move in between paragraphs or needing to search to determine whether there is a prior paragraph to read."

Challenge

A physician's practical need for fast and easy (30 sec) methods of creating clinical documentation

The enterprise need for structured and coded information capture to support meaningful use

Challenge & Response

- Can we create an electronic record that ensures value for
    - Care delivery
    - Evidence-based medicine
    - And which endures over time, as technology evolves?
- Most electronic patient records and health information exchanges operate on a small percentage of the available information.
- Vision
    - Comprehensive electronic records that
    - Tell a patient's complete health story.

Challenge & Response

- Use simple, stable, established formats for information exchange.

    - These exist, are inexpensive to implement, and

    - will lower the barriers to information sharing.

- Be more like the Web and less like a database.

- Open exchange networks to Big Data, incrementally structured.

- Benefits of this approach:

    - Less disruptive – adapts to wider range of technology, giving clinicians more choice in how they capture and communicate information.

    - More useful – the record is more complete, mitigating the distortion introduced by single-minded focus on structured data capture

Ensuring Value

1. Challenge & Response

2. **Background: 2006 to 2013**

3. The "How": Just enough about standards

4. Present & Future: Technology & Policy

Background

- Non-profit, industry alliance
- Founded as "CDA for Common Document Types" (aka CDA4CDT) in 2006 by
  - M*Modal
  - Association for Healthcare Document Integrity (AHDI)
  - American Health Information Management Association (AHIMA)
  - Alschuler Associates (aka Lantana)
- Members provide direction, elect Executive Committee
- Supported development of eight (8!) implementation guides for common clinical documents within three years
- In 2013, affiliated with HIMSS as a HIMSS Roundtable

Project Members (pre-HIMSS)

Organization Affiliates

Promoters

Contributors

Canon U.S.A.

Participants

Apixio - BayScribe - ChartLogic
Emdat - Healthwise - InfraWare
Mediscribes - MedEDocs - MEDfx
Physicians Medical Group of Santa Cruz County
St. John's Regional Medical Center

Background

- Associate Charter Agreement with HL7
  - Health Story convened stakeholders and supported specification development
  - Balloted through HL7 which retains ownership

- Initiated project to *consolidate* 8 guides into single guide and also

  - Update Continuity of Care Document (CCD)

  - Harmonize with Integrating the Healthcare Enterprise (IHE)

  - Integrate constraints from ONC's HITSP C32

  - Created Consolidated CDA (C-CDA) cited in MU2

Considated CDA

- CCD
- Consultation Note
- Diagnostic Imaging Report
- Discharge Summary
- H&P
- Operative Note
- Procedure Note
- Progress Note
- Unstructured Document

- **Cited in Meaningful Use Stage 2**
    - **Except....**

CDAR2_IG_IHE_CONSOL_R1_U1_DSTU_2011JULY

Implementation Guide for CDA Release 2.0

Consolidated CDA Templates

(US Realm)

July 2012

Produced in collaboration with:
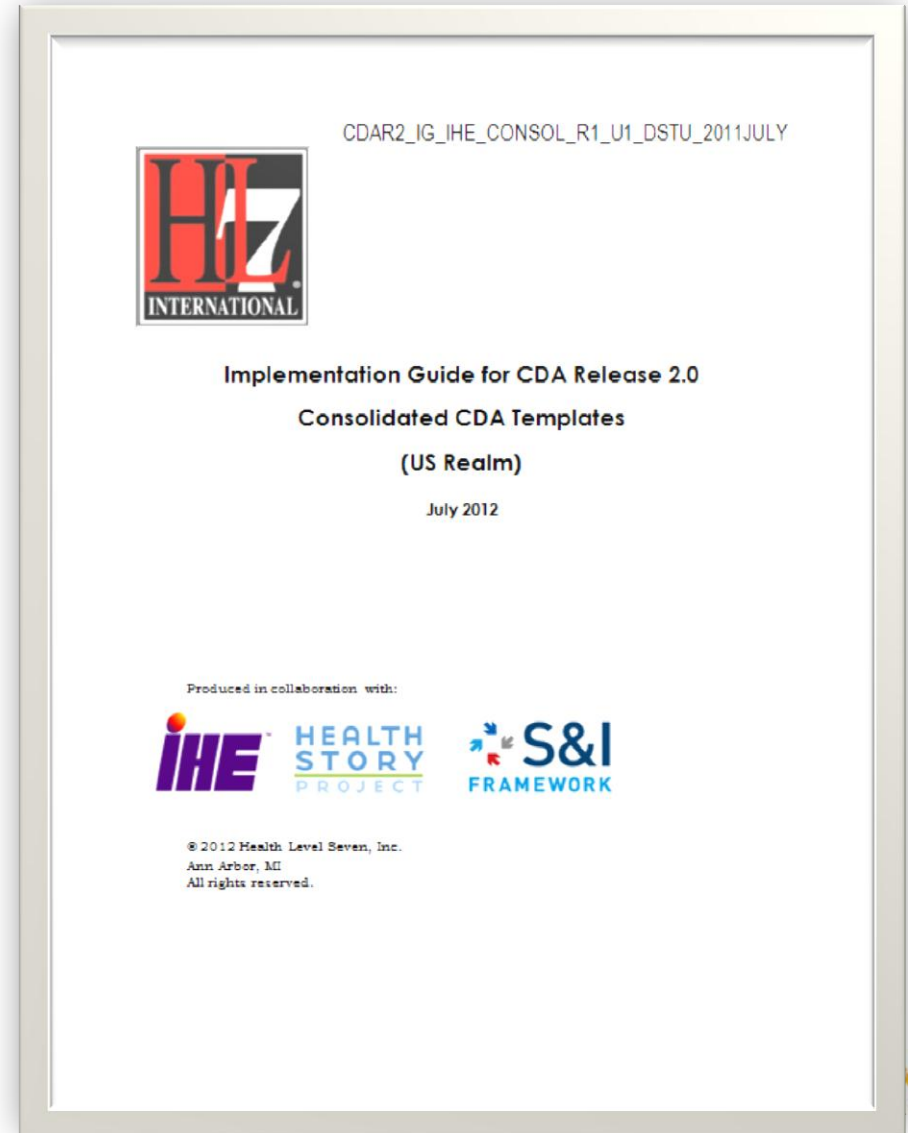
... *but*

- ***Meaningful Use Stage 2 does not leverage the simple, low-end of the standard.***

- Instead,

    – it focuses exclusively on exchange of a narrow set of highly-structured data elements.

    – And it orphaned Unstructured Document

- How could this work if the ***policy*** were to change?

    – Stay tuned, but

    – first this word about … CDA

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The HL7 CDA

- HL7 Clinical Document Architecture

  – Release 1.0 2000; Release 2.0 2005

  – A specification for exchange of clinical documents, defining their structure and semantics

  – Abstract/generic specification covers all document/note/report types

  – ANSI standard developed by HL7's Structured Documents Work Group (SDWG)

- Widely implemented, internationally, as an ISO standard

- CDA R2 relies on

  – XML

  – HL7 Reference Information Model

  – Controlled vocabularies (SNOMED, LOINC, CIE-9, HL7, etc.)

The CDA Document Defined

- CDA Release 2, section 2.1
- A clinical document ... has the following characteristics
  - Persistence
  - Stewardship
  - Potential for authentication
  - Context
  - Wholeness
  - Human readability
- Therefore, CDA documents are not
  - Data fragments, unless signed
  - Birth-to-death aggregate records
  - Electronic health records

CDA Basics

- A Header + Body
- CDA Header:
  - Patient, provider, and encounter information
  - Metdata required to manage the document in any context
- CDA Body
  - Clinical report
    - Discharge summary, Progress note, History and physical (H&P)…
    - Healthcare Associated Infection (HAI) Report
    - Cancer Registry report
    - Quality report
  - Contains the report information in both
    - narrative (free-text) form *required* and
    - coded (computable) form *optional*

Investing in Information

- CDA can be simple
- CDA can be complex
- Simple encoding relatively inexpensive
- Complex encoding costs more
- You get what you pay for
  - like charging a battery,
  - the more detailed the encoding
  - the greater the potential for reuse

HEALTH STORY PROJECT

Sa...

C:\KEG\R2M1\CDA.ReleaseTwo.MembershipBallot01.Jan.2005\html\infrastructure\cda\SampleCDADocumen

File   Edit   View   Favorites   Tools   Help

Back   Search   Favorites

```
+ <custodian>
- <recordTarget>
  - <patient>
      <id extension="12345" root="2.16.840.1.113883.3.933" />
    - <patientPatient>
      - <name>
          <given>Henry</given>
          <family>Levin</family>
          <suffix>the 7th</suffix>
        </name>
        <administrativeGenderCode code="M" codeSystem="2.16.840.1.113883.5.1" />
        <birthTime value="19320924" />
      </patientPatient>
    + <providerOrganization>
    </patient>
  </recordTarget>
+ <relatedDocument typeCode="
+ <componentOf>
- <!--

    *****************************
    CDA Body
    *****************************
  -->
- <component>
  - <structuredBody>
    - <!--

    ********************************************************************
    History of Present Illness section
    ********************************************************************
      -->
    - <component>
      - <section>
          <code code="10164-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC" />
          <title>History of Present Illness</title>
        - <text>
          - <content styleCode="Bold">
              Henry Levin, the 7
```
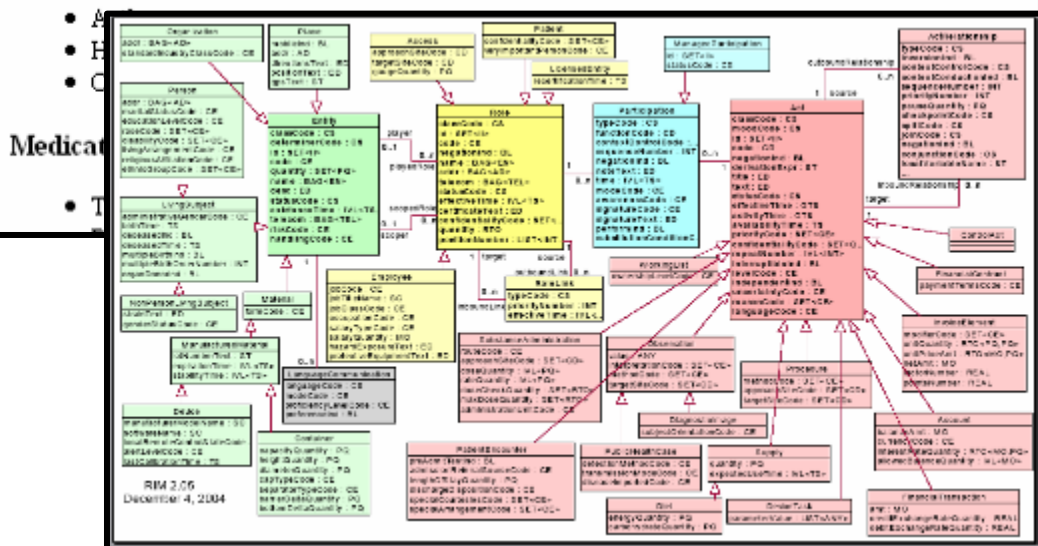
- Header
- Body
  – Readable: required
  – Computable: optional

Good Health Clinic Consultation Note -

File   Edit   View   Go   Bookmarks   Tools   H

file:///C

Subscribe with Blogli...

Good Health

Patient: Henry Levin , the 7th
Birthdate: September 24, 1932
Consultant: Robert Dolin , MD

History of Present Illness

Henry Levin, the 7th is a 67 year
asthma in his teens. He was hospita
been able to be weaned off steroid

Past Medical History

- Asthma
- Hypertension (see HTN.cda for de
- Osteoarthritis, right knee

Medications

- Theodur 200mg BID
- Proventil inhaler 2puffs QID PRN
- Prednisone 20mg qd

HEALTH
STORY
PROJECT

No

Good Health Clinic Care Record Summary

File   Edit   View   Favorites   Tools   Help

Back   Search   Favorites

Address   iora Alschuler\My Documents\KEG\CareRecordSummary\samples\CDAR2_LEVEL1_EXAMPLE.nonXML.1.xml   Go   Norto

Patient: Ellen Ross   **MRN:** 12345

17 Daws Rd.
Blue Bell, MA 02368
HP: (781) 555-1212

Birthdate: January 27, 1960   **Sex:** Female
Consultant: Bernard Wiseman , Sr.   **Created On:** March 29, 200

Good Health Clinic Care Record Summary

Good Health Clinic Care Record Summ

File   Edit   View   Favorites   Tools   Help

Back

Address   C:\Documents and Settings\Liora Alschu

To help protect your security, Internet Explorer

Patient: Ellen Ross

17 Daws Rd.
Blue Bell, MA 0236
HP: (781) 555-1212

Birthdate: January 27, 1960
Consultant: Bernard Wiseman ,

Good Heal

Final Showing Markup   Show

Advance Directives

Documentation	Contact	Effective Date	Comments
Liv			
Pow Att			
Org			Organ

Condition

Act

```
          </performer>
        </serviceEvent>
      </documentationOf>
-   <component>
  -   <nonXMLBody>
    -   <text mediaType="text/rtf">
          <reference value="Patient.rtf" />
        </text>
      </nonXMLBody>
    </component>
  </ClinicalDocument>
```

CDA Body: Machine Processible

- Model-based computable semantics

  - Observation

  - Procedure

  - Organizer

  - Supply

  - Encounter

  - Substance Administration

  - Observation Media

  - Region Of Interest

  - Act

```
<title>Past Medical History</title>
- <text>
  - <list>
    - <item>
        <content ID="a1">Asthma</content>
      </item>
    + <item>
    + <item>
    </list>
  </text>
- <entry>
  - <observation classCode="COND" moodCode=    Optional
      <code code="39154008"
```
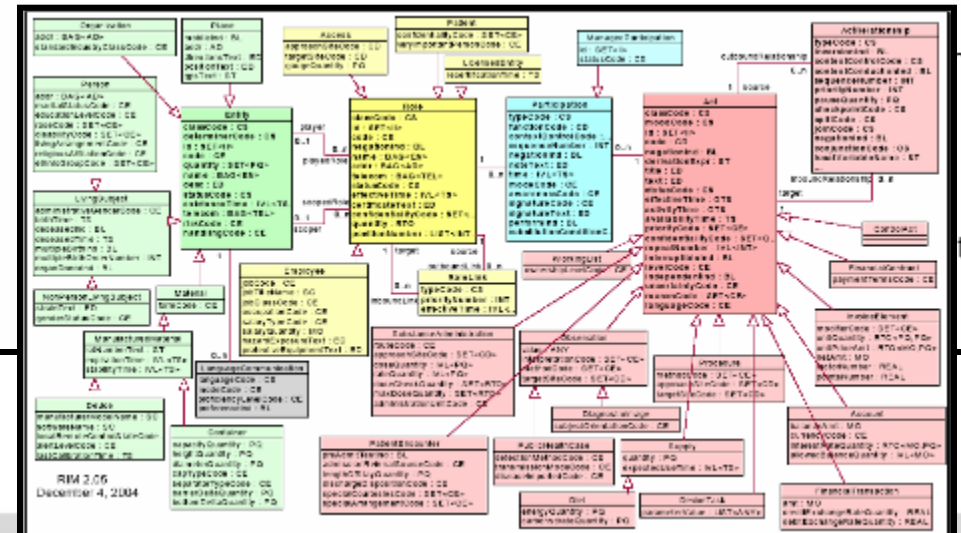
Standard HL7 metadata

Simple XML for point of care human readability

RIM semantics for reusable computability ("semantic interoperability")

US Initiatives

- Meaningful Use…

- Healthcare Associated Infection (HAI) reporting to the National Healthcare Safety Network, Centers for Disease Control and Prevention

- Quality Reporting Document Architecture (QRDA)

- Patient Safety Common Format (AHRQ)

- Personal Health Monitoring (PHM), Continua Alliance

- CHNC Neonatal Care Report (Neonatal Care Report)

- New:

  – Clinical Oncology Patient Transfer Summary

  – Behavioral Health Assessment

  – HIV/AIDS Services Report

  – Privacy Consent Directives

  – Structured Form Definition Document

  – Transfer of Care, Referral Request and Report, Plan of Care

Ensuring Value

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4. **Present & Future: Technology & Policy**

Investing in Information

- CDA can be simple
- CDA can be complex
- Simple encoding relatively inexpensive, complex encoding costs more

- **Gall's Law** is a rule of thumb from John Gall's *Systemantics: How Systems Really Work and How They Fail*:

    - A complex system that works is invariably found to have evolved from a simple system that worked.

    - The inverse proposition also appears to be true: A complex system designed from scratch never works and cannot be made to work. You have to start over, beginning with a working simple system.

There is Structure in Dictated Notes

Creating Discrete Entries

- Methods for acquiring codes from notes:
- Computer-assisted coding (CAC)
- Natural language processing (NLP)
- Data capture templates
- Good old text processing and pattern matching
- Mobile and smart phone technology

- → Applying standard HL7 CDA markup makes the discrete entries usable within an EHR and for the meaningful use program
- → Defining the target structure and entries makes NLP engines smarter

Evolutionary Semantic Interoperability with CDA R2

Interoperability increase level

Additional effort to achieve it

Add content

Add structure

Add structured clinical content

For "My region/ use case"

1 GIF JPG TIFF

2 PDF DOC(X) TXT

3 CDA R2 Nonstructured Body

4 CDA R2 Structured Body Standardized sections

5 CDA R2 Structured Body Standardized sections Coded entries

6 CDA R2 IG
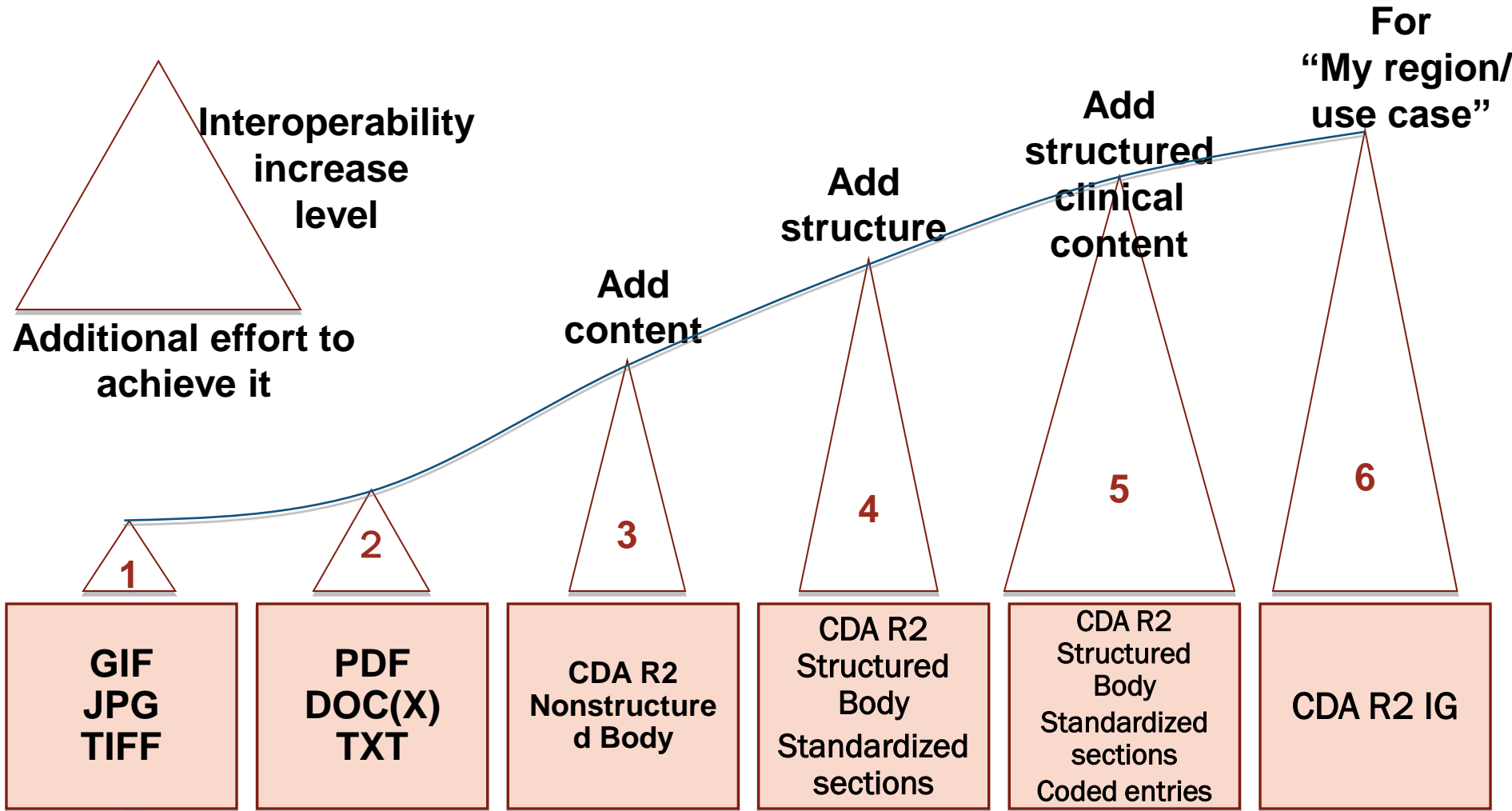
We are looking for a shift in policy

- Lower the threshold for information exchange so that
  - all may participate
  - approach 100% of the records for 100% of patients
- Incentivize participation
  - at all levels with
  - higher reward where there is higher potential to automate reuse.
- Recognize diversity of applications
  - EMR is not the proverbial hammer
  - need applications to originate, manage, code, and analyze
- Respect
  - the clinical thought process inherent in documentation
  - the need for data that is concise and relevant as well as coded
- Provide value back to those who incur the costs

We are looking for a shift in policy

- Approximately 1.2 billion narrative clinical documents are produced in the US each year.

- These documents comprise around 60% of clinical information captured in electronic health records.

- Thought processes are captured via physician narrative, never via checkboxes

- This tremendous source of valuable clinical information is completely underutilized

- Technologies are now available to make the unstructured clinical record accessible and actionable

We Have a Challenge

A physician's practical need for fast and easy (30 sec) methods of creating clinical documentation

The enterprise need for structured and coded information capture to support meaningful use

Incremental Approach

1. Get the data flowing, get the data flowing, get the data flowing.
2. Incrementally add structure, where cost effective to do so.

Quality Reporting

Decision Support

Clinical Applications

Meaningful Use!

Narrative Text

HL7 CDA Structured Documents

Coded Discrete Data Elements

SNOMED CT

Disease, DF-00000

Metabolic Disease, D6-00000

Disorder of carbohydrate metabolism, D6-50000

Disorder of glucose metabolism, D6-50100

Diabetes Mellitus, DB-61000

Type 1, DB-61010

Neonatal, DB75110

Carpenter Syndrome, DB-02324

Insulin dependant type IA, DB-61020
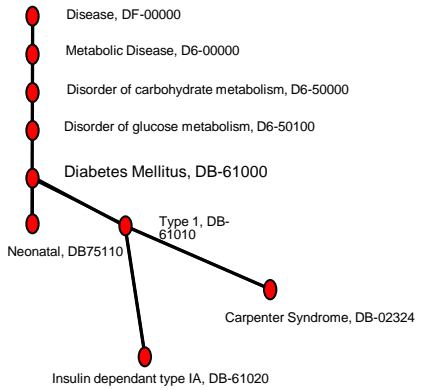
Value Statement

- A health record is the patient's "health story"
    - shared by the patient and the circle of caregivers
    - sharing encompasses both access and authorship.

- The primary purpose of the record is to support care delivery
    - This, in turn, will support better health.
    - Secondary reuse should be supported.

- Electronic records must produce a longitudinal record of lasting value
    - expressing the thought processes behind the delivery of care,
    - preserving this for future readers.

- Clinical records must be complete, well organized, easy to navigate, concise, logical, adaptable to the needs of the user, sharable, and secure.

- Electronic records and new technologies
    - support shared decision-making,
    - document use of practice guidelines, and
    - support evidence-based practice.

HEALTH STORY PROJECT

Benefit	Value
Retains patient story	Maintains primary role of documentation to clearly describe and communicate what is going on with patient.
Preserves physician time for clinical care	Makes efficient use of physician time by enabling choice of documentation methods and fosters EMR acceptance
Supports meaningful use	Interoperability: implements HL7 CDA document standards for electronic exchange of clinical information – incrementally
Enables data reuse	Structured narrative enables better outcomes reporting, data mining, and decision support
Collaborative approach	Developed by broad array of providers, vendors and IT organizations; Balloted process through HL7 supports harmonization

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Challenge

◄ **Neil Versel,** Contributing Writer

'Note bloat' putting patients at risk

'Every progress note shouldn't be a running blog'

SCOTTSDALE, AZ | October 10, 2013

Tweet 38   +1 3   Recommend 5   Share 13

Healthcare organizations with long-established electronic health records run the risk of "note bloat" and compromised patient safety unless they standardize physician documentation procedures and limit the amount of cutting-and-pasting doctors have to do, attendees of CHIME's Fall CIO Forum heard here at a session on Oct. 9.

"It's been challenging for docs and healthcare systems in general … to produce a document that reflects the patient story in the most concise, complete and informational way," said

G. Daniel Martich, MD

Jody Cervenak, principal of Pittsb

Cervenak quoted 17th Century F longer than usual, only because I

Or, in the concise words of G. Da Pittsburgh Medical Center, "More

"It's been challenging for docs and healthcare systems in general …to produce a document that reflects the patient story in the most concise, complete and informational way."

Jody Cervenak, Aspen Advisors

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"Data that have been copied and pasted into the medical record or inserted in a rapid series of mouse clicks has bypassed this critical transformative process…

"I fear that as it becomes more and more difficult to write like a clinician, sooner or later it will become more difficult to think like one."

Learn More, Stay in Touch, & Get Involved

- Get on mailing list

- Attend weekly calls

- Get involved

  - Filling gaps in technical specs

    - Patient-originated notes

    - Diet & Nutrition

    - What else?

  - Recruitment campaign

  - HIMSS 2013 Showcase

Demonstrating
Consolidated CDA
on the floor at
HIMSS12, HIMSS11
&
at
HIMSS13

Contact!

- http://www.himss.org/health-story-project
- Mission statement
- Value statement
- Bibliography
- Press release on HIMSS Health Story
- HIMSS Staff Support
    - Celina Roth
    - Manager, Staff Liaison to the Health Story Project
    - Phone: +1-312-915-9213
    - CRoth@himss.org