Illustrations of Community HIEs & Interoperability

Liora Alschuler, CEO, Lantana Consulting Group

HEALTH STORY PROJECT

Learning Objectives:

- Discuss the evolution and past contributions of the Health Story Project and corresponding partnerships.
- Describe how the Health Story Project will raise awareness and improve information exchange and interoperability for the purposes of coordinated patient care, payer-provider integration and population health.
- Explain the role and impact the HIMSS Health Story Project will play in various areas, such as dictation, document management, coding, analytics and electronic health records.

About Me

- Background in electronic text, how to make large amounts of information usable on a computer
- As volunteer worked to
  - Bring XML to healthcare exchange standards
  - Develop the CDA, CCD, Consolidated CDA
  - Co-found the Health Story Project
  - Bring 8 interoperability demonstrations to HIMSS, starting in 1999
- 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
  - Participate in the CDA Academy (www.cdaacademy.com)

Challenge

VIEWPOINT

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.

The Challenge to the Medical Record

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

Observe, record, tabulate, communicate.
Sir William Osler

uted have become more and more inscrutable, it has

Thirty years ago, no
and second-year me
medical histories and
occurred to me that
write. I came to see
forming a physical ex
like electrocardiogra
studies, and organizi

"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…"

Challenge

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

JAMIA, published online, January 12, 2011

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

Correspondence to
Dr S Trent Rosenbloom, Eskind Biomedical Library, Room 440,

ABSTRACT

Clinical documentation is central to patient care. The success of electronic he... may depend on how we... documentation. A major... documentation into elec... to generate reusable da...

documentation (CBD) systems that promote real-time structured clinical documentation.

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.

The SMART C-CDA Collaborative

SMART

Lantana CONSULTING GROUP

1. OUTREACH

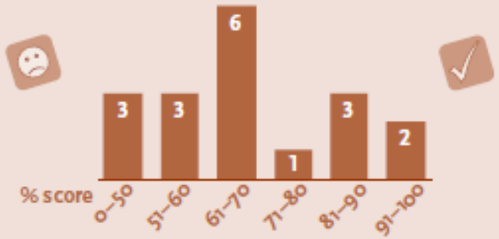
107 Vendors contacted → 44 Responses → 22 Technologies Represented (Most aligned with MU 2 requirements) → 10 Group Meetings

What's hard? How to improve? (Via webinars & online discussions) → 50 Ideas for C-CDA examples → 40+ C-CDAs Posted (At github.com/chb/sample_ccdas/) → >100,000 Lines (XML examined) | >1,000 Aspects (Heterogeneity observed)

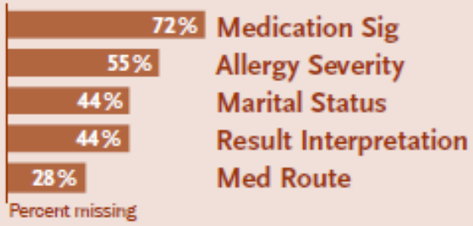
2. EVALUATION*

SMART C-CDA SCORECARD†

Number of Documents in Each Score Range



MISSING DATA



TERMINOLOGY

- 67% All Problems in SNOMED
- 53% Pre-Coordinated Meds in RxNorm
- 44% Codified Allergic Reactions
- 39% Uses UCUM for Results & Vitals

ERRORS

Example: Excess Precision

```
<effectiveTime value="20131202000000+500" />
```

Trailing zeroes present when only date known

Did event really happen at stroke of midnight?

Full error list: bit.ly/smart-ccda-findings, pages 5–9

*Source: Single C-CDA from 18 MU2-compliant EHR/HIE technologies

†SMART C-CDA Scorecard: ccda-scorecard.smartplatforms.org

3. IMPROVEMENT

930 Minutes Spent with 11 Individual Vendors reviewing document quality

6 Key Challenges

1. Smoking history
2. Problem status & timing
3. Medication dose & timing
4. Medication allergies & reactions
5. Highly structured lab results
6. Highly structured vital signs

Improving Interoperability

© 2014 SMART Platforms. SMART Platforms Project is an ONC-funded research project at Harvard Medical School/Boston Children's Hospital. SMART and Lantana collaborated with EMR/HIE vendors to perform a detailed review of vendors' Meaningful Use Stage 2 Consolidated-CDA documents. More at smartplatforms.org/2013/07/introducing-the-smart-c-cda-collaborative/.

IHE USA

smartplatforms.org

- Standard semantics are hard
- 25-33% of MU1 EHRs may not re-certify
- Many not ready for quality reporting

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?
- 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.

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

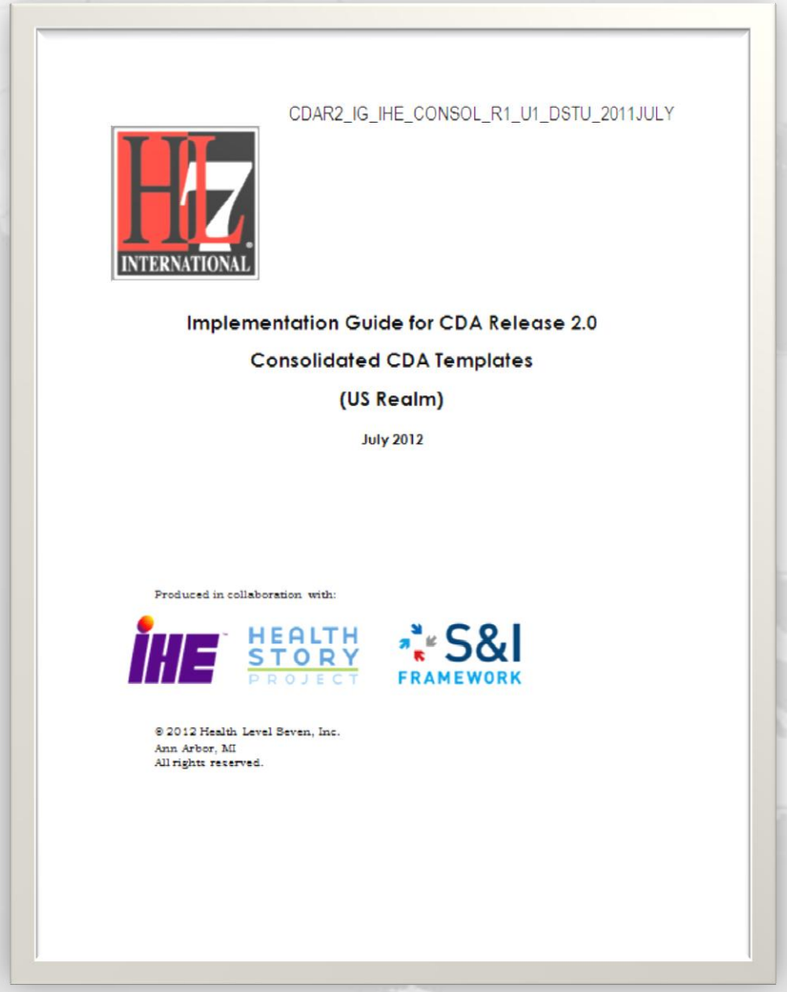
Background

- 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

Consolidated 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
All Very Nice Except….



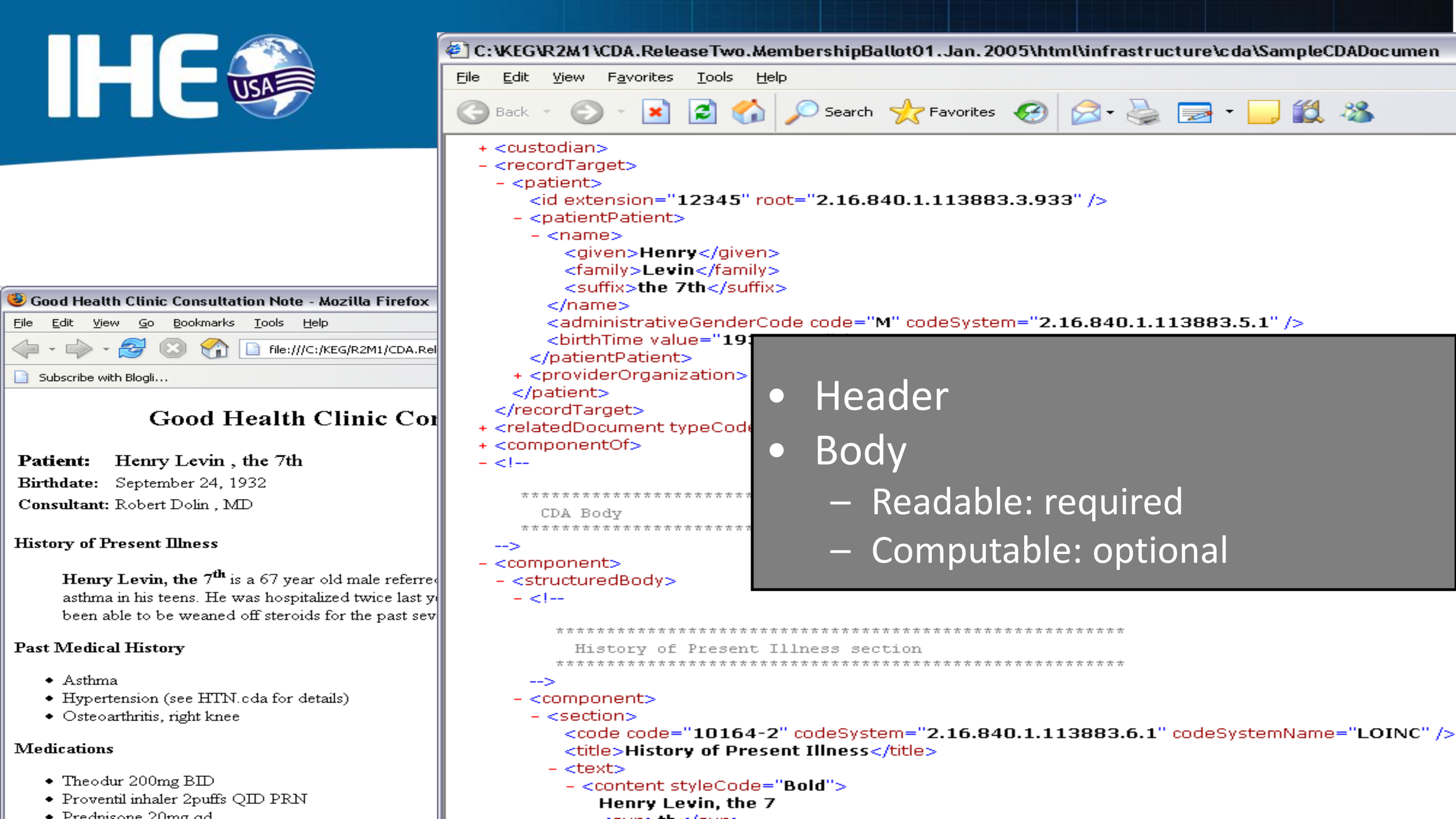
- ***Meaningful Use Stage 2 does not leverage the simple, low-end of the standard.***
- Instead:
  - "Meaning" derived from a narrow set of highly-structured data elements.
  - It orphaned Unstructured Document.
- How could this work if the ***policy*** were to change?

  Stay tuned,

  first this word about … CDA.

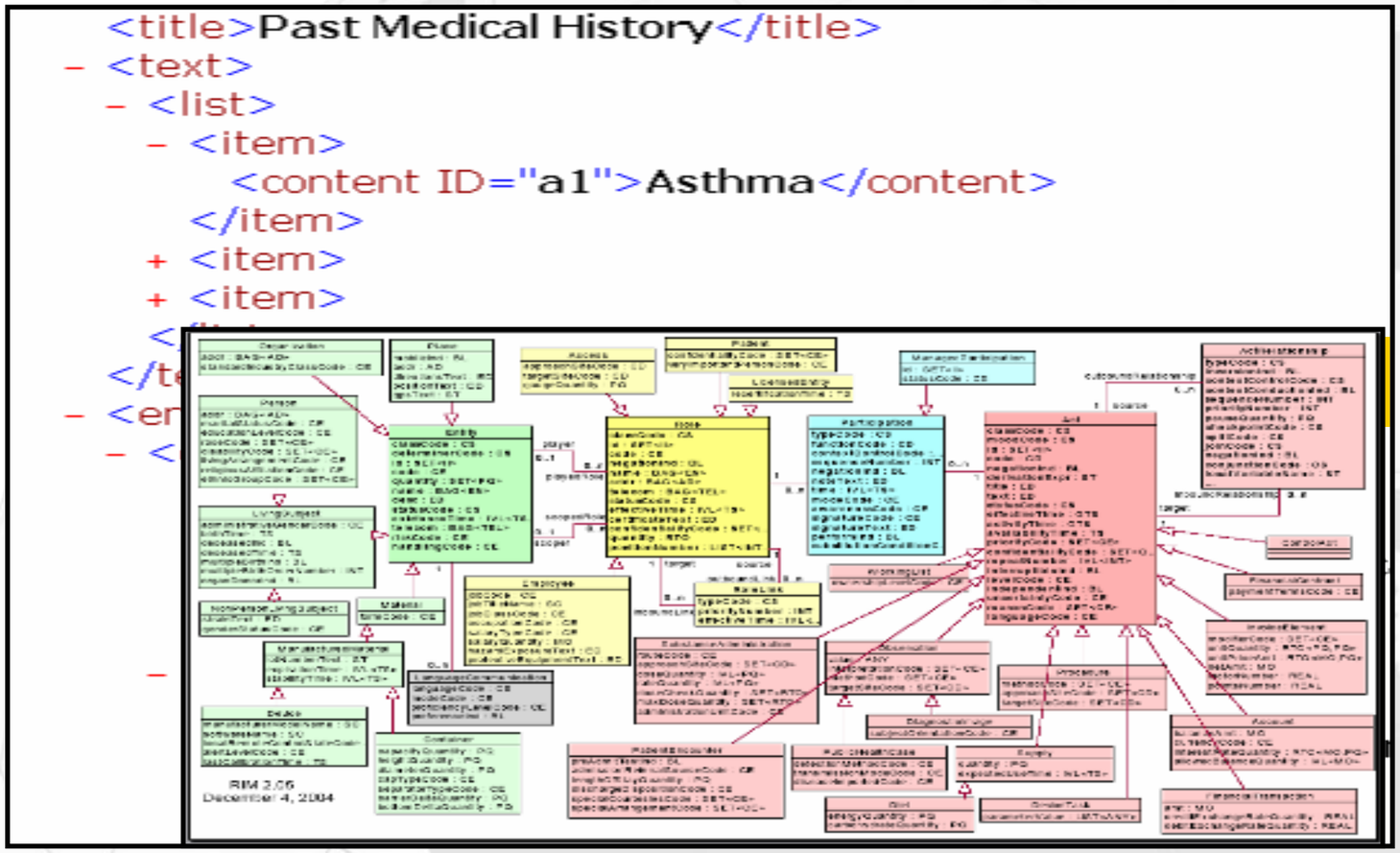
CDA Basics

- CDA Header:
  - Patient, provider, and encounter information
  - Metadata 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***


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="19
</patientPatient>
+ <providerOrganization>
</patient>
</recordTarget>
+ <relatedDocument typeCod
+ <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
Good Health Clinic Consultation Note - Mozilla Firefox
File Edit View Go Bookmarks Tools Help
file:///C:/KEG/R2M1/CDA.Rel
Subscribe with Blogli...
Good Health Clinic Cor
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 old male referre
asthma in his teens. He was hospitalized twice last y
been able to be weaned off steroids for the past sev
Past Medical History
Asthma
Hypertension (see HTN.cda for details)
Osteoarthritis, right knee
Medications
Theodur 200mg BID
Proventil inhaler 2puffs QID PRN
Prednisone 20mg qd
Header
Body
Readable: required
Computable: optional

CDA Body: Machine Processible

- Model-based computable semantics
  - Observation
  - Procedure
  - Organizer
  - Supply
  - Encounter
  - Substance Administration
  - Observation Media
  - Region Of Interest
  - Act



Investing in Information

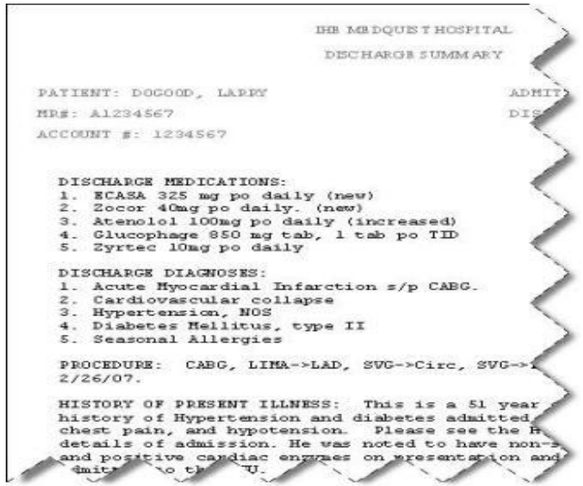
- CDA can be simple
- CDA can be complex
- Simple encoding relatively inexpensive
- Complex encoding costs more
- You get what you pay for
  - Like charging a battery
  - The more detailed the encoding
  - The greater the potential for reuse

Investing in Information

- **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.

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.



IHE MEDQUEST HOSPITAL

DISCHARGE SUMMARY

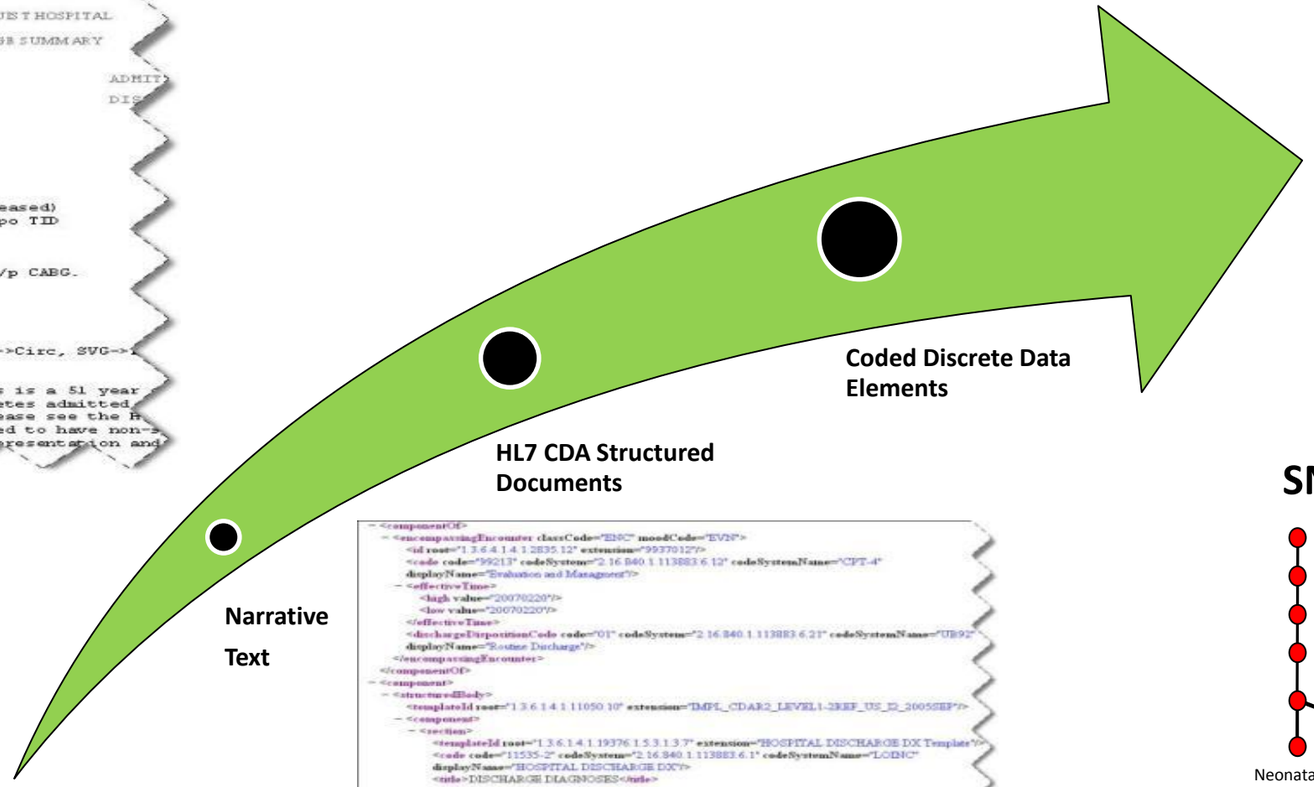
PATIENT: DOGOOD, LARRY ADMIT:
MR#: A1234567 DIS
ACCOUNT #: 1234567

DISCHARGE MEDICATIONS:
1. ECASA 325 mg po daily (new)
2. Zocor 40mg po daily. (new)
3. Atenolol 100mg po daily (increased)
4. Glucophage 850 mg tab, 1 tab po TID
5. Zyrtec 10mg po daily

DISCHARGE DIAGNOSES:
1. Acute Myocardial Infarction s/p CABG.
2. Cardiovascular collapse
3. Hypertension, NOS
4. Diabetes Mellitus, type II
5. Seasonal Allergies

PROCEDURE: CABG, LIMA->LAD, SVG->Circ, SVG->
2/26/07.

HISTORY OF PRESENT ILLNESS: This is a 51 year
history of Hypertension and diabetes admitted
chest pain, and hypotension. Please see the H
details of admission. He was noted to have non-
and positive cardiac enzymes on presentation and
dmit to th U.



Narrative Text

HL7 CDA Structured Documents

Coded Discrete Data Elements

<component>
<encompassingEncounter classCode="ENC" moodCode="EVN">
<id root="1.3.6.4.1.4.1.2835.12" extension="99370127"/>
<code code="99213" codeSystem="2.16.840.1.113883.6.12" codeSystemName="CPT-4"
displayName="Evaluation and Management"/>
<effectiveTime>
<high value="20070220"/>
<low value="20070220"/>
</effectiveTime>
<dischargeDispositionCode code="01" codeSystem="2.16.840.1.113883.6.21" codeSystemName="UB92"
displayName="Routine Discharge"/>
</encompassingEncounter>
</component>
<component>
<structuredBody>
<templateId root="1.3.6.1.4.1.11050.10" extension="IMPL_CDAR2_LEVEL1-3REF_US_ID_2005SEP"/>
<component>
<section>
<templateId root="1.3.6.1.4.1.19376.1.5.3.1.3.7" extension="HOSPITAL DISCHARGE DX Template"/>
<code code="11535-2" codeSystem="2.16.840.1.113883.6.1" codeSystemName="LOINC"
displayName="HOSPITAL DISCHARGE DX"/>
<title>DISCHARGE DIAGNOSES</title>
<text>
<paragraph>1. Acute Myocardial Infarction s/p CABG</paragraph>
<paragraph>2. Cardiovascular collapse</paragraph>

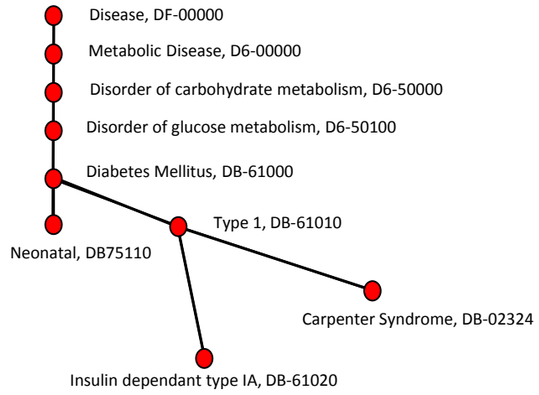
Quality Reporting

Decision Support

Clinical Applications

Meaningful Use!

SNOMED CT



Incrementalism is the CDA DNA

- 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

We are looking for a shift in policy

- Lower the threshold
  - 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 a proverbial hammer, not everything is a nail
  - 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

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.

Value Statement

- 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.

HIMSS 2014

- Standards:
  - Consolidated CDA
  - Cancer Treatment Plan & Summary
  - **NEW:** Care Plan
  - **NEW**: Patient Questionnaire/response
- Highlights:
  - Patient engagement
  - Flexible information capture
  - Care coordination
  - **Full record**

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 2014 Showcase

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
- Liora.Alschuler@lantanagroup.com