

Redwood MedNet
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Connecting California to Improve Patient Care

Meaningful Use and HIEs – The Role of Structured Data and Data Integrity

Michael Stearns, MD, CPC, CPFC
President and CEO
e-MDs, Inc.

HealthCare Challenges

“Studies have shown that most health care is not based on clinical studies of what works best and what does not — be it a test, treatment, drug or technology. Instead, most care is based on informed opinion, personal observation or tradition”

NYTimes OpEd Article

Critical need for structured data collected from multiple care settings:

- Improve the quality of healthcare
- Improve the cost-effectiveness of health care
- Support research

Meaningful Use Criteria

- Initial draft June 16th by the HIT Policy Committee
 - Connectivity a high priority
 - In order for a physician to be considered a meaningful user:
 - They must be connected in a manner that provides for electronic exchange of health data to **improve** quality of care
 - They must provide information to the government on clinical quality measures

Meaningful Use Related to HIEs

- The goal is to exchange structured clinical data in a way that is accurate and complete so it can **improve** patient care
- Ideally this would include data that is:
 - Codified in a standard terminology that supports semantic interoperability
 - Represents at a minimum key clinical data in addition to assessments, problem lists, and orders
 - Structured in a way that makes retrievals and data exchange complete and accurate
 - Exchanged via a standardized messaging format that supports data integrity
- If done poorly data received via HIEs could cause patient injury and result in poor assessments of healthcare quality and efficiency

Examples of Potential Problems

- Physician performance data used to rank providers, participation in healthcare plans, maintenance of certification, licensing, reimbursement from P4P programs, etc.
- Example potential problem areas
 - Diabetic monofilament foot checks – physician penalized for not performing, however:
 - Patients included who are status-post bilateral below the knee amputations
 - Cataract surgery
 - A provider has a high complication rate, but is the only ophthalmologist in an area who will operate on high risk patients

Challenge: The Use of Claims Data in HIEs

- ICD-9-CM was not designed for information systems
- Clinicians often choose codes that are appropriate for administrative purposes but not for clinical use
 - Documentation of medical information should not be influenced by “business” relevance
 - E.g., Supporting approval of a procedure or disability eligibility

ICD-9-CM Challenges

- ICD-9-CM
 - Not concept based
 - Multiple different concepts all share the same code
 - E.g., Neurolysis (peripheral nerve) NEC 04.49
 - Lack of content coverage
 - Lack of formal synonyms
 - Limited structure
 - Unable to recognize redundancy

SNOMED CT and ICD-9-CM Comparison Based on the “Desiderata”

Methods Inf Med. 1998 Nov;37(4-5):394-403. Review

Desiderata	SNOMED CT	ICD-9-CM
Content coverage	High	Low
Concept orientation	Yes	No
Concept permanence	Yes	Informally
Non-semantic concept identifiers	Yes	No
Polyhierachy	Yes	No
Formal concept	Yes	No
Rejection of “Not Elsewhere Classified” terms	Yes	No
Multiple granularities	High (20 levels)	Low (two levels)
Multiple consistent views	Yes (can be	No (very limited)
Context representation	Yes	No
Graceful evolution	Strong history	Basic history mechanism
Recognized redundancy	Yes	No

SNOMED CT®

- >365,000 Concepts
- >1,000,000 terms
- >1,000,000 logically defined relationships
- Meets approved federal standards
- Required in electronic health records in 2008 (for certification)
 - Organism names only
 - More will be required in future years

Is SNOMED CT the Answer?

- Extremely formal representations make it hard to use in electronic health records (EHRs)
 - Lack of natural sounding phrases
 - Too much effort required to tie SNOMED CT codes to the text in clinic records
- This has given rise to “interface” terminologies designed for use in EHRs, including a SNOMED CT subset mechanism

Codifying Simple Expressions

- Simple expressions like appendicitis can be represented by one code and safely sent in a message
 - As long as both systems are using the same code there is little risk of error
 - This is generally all that is needed for billing purposes

Codifying Complex Expressions

- The value of HIEs and clinical reporting initiatives are tied to their ability to manage complex expressions
 - E.g., Ruptured appendix resulting in peritonitis and sepsis
 - Codes can be grouped in “code phrases” to represent this complex expression using 4 codes
 - Appendicitis code
 - Ruptured code (as modifier)
 - Secondary code + Peritonitis code
 - Secondary code + Sepsis code
 - The standards supporting which code sets, how they are organized in messages, and how data integrity is validated have not been fully determined

Semantic Interoperability

Data integrity challenges

■ Negation

- e.g., make sure “no history of diabetes” does not come over as “history of diabetes”

■ Uncertainty

- e.g., A sample assessment:
 - Etiology of symptoms not well defined
 - “Multiple sclerosis unlikely”

■ Code arrangement in message has to support the order of concepts in the phrase

- “Reactive depression with anorexia but no suicidal ideation” could come across as:
 - “Reactive depression with suicidal ideation but no anorexia”

Information Flow Will Start with EHR:

- Topic specific templates can be used that improve ease of capture of codified data
 - e.g., Open Angle Glaucoma: concept stored of single code
- Can store commonly used phrases that are likely to be used for that type of encounter
 - e.g., crampy right lower quadrant abdominal pain
 - Commonly used phrases are pre-coordinated by using several codes in the template, in advance
 - Codified data is mapped to this phrase in advance

Post-Coordination During Documentation in the EHR

- Less commonly used expressions *could* be assembled from preexisting concepts (i.e., post-coordination) during EHR documentation
 - E.g., “Neck injury caused by being struck in buttocks by goat while bending over - driving head into stone wall”
 - We still need a free text option...



Questions?

Thank You

Contact Information:

Michael Stearns, MD, CPC

President and CEO

e-MDs, Inc.

9900 Spectrum Drive

Austin, Texas 78717

Email: mstearns@e-mds.com