

National Committee on Vital and Health Statistics

Hearing to Receive Testimony from
Terminology Users,
Healthcare Information System Vendors,
and Healthcare SDOs

October 15, 1999



3M Health Information Systems

a Division of 3M

Lee Min Lau MD PhD

3M Healthcare Data Dictionary (HDD)

Chair of the CPRI Taskforce for the Promotion of
Standards and Vocabularies





Patient Medical Record Information (PMRI)

- Clinical and non-clinical data that describes:
 - Patient information, e.g. name, gender, race
 - Encounter information, e.g. insurance, location, caregivers, discharge disposition
 - Clinical information, e.g. complaint, past history, family history, social/behavioral finding, physical assessment, laboratory finding, diagnosis, medication, procedure
- Linked to episodes of care but also across encounters (longitudinal/lifetime)



Comparable Patient Medical Record Information (PMRI)

- For a patient: across episodes of care, regardless of care provider or location
- For an institution: across patients, regardless of departments or facilities; and across time
- For a country: across institutions, patients, locations, and time

Comparable PMRI is required for individual patient care as well as population-based functions such as outcomes research



Comparable Patient Medical Record Information (PMRI)

- For PMRI to be comparable, each piece of data must first be precisely and accurately defined
- Precision and accuracy of the data (value) is not the same as the precision and accuracy in defining the data
- For example, a lab test of Hematocrit can be precisely and accurately defined, however, the data value may be wrong (for instance, Hct of 30% instead of 50% being placed into the record)



Definition of Patient Medical Record Information (PMRI)

- Not only the definition of the medical record information structure (information model), which is:
 - the identification of the pieces of information that makes up a meaningful record
 - e.g. a medication order consists of the drug, dose, form, route, frequency, start time, stop time, etc.
 - the data type and precision of each piece of data may be included, e.g. dose is a decimal value (to 2 places, for instance)



Definition of Patient Medical Record Information (PMRI)

- Also the definition (meaning) of each data item, e.g. drug, antibiotic, penicillin, ampicillin
- Including synonyms and relationships
- Taking into account granularity as well as composition-decomposition
- In other words, functions served by a **vocabulary**
- Definition must be precise and accurate for PMRI to be comparable
- Formal definitions such as that used by SNOMED RT



Definition of Patient Medical Record Information (PMRI)

- Having precise and accurate definitions does not mean that medical record structures or data values must be identical, it just means that if meanings are clearly known PMRI becomes comparable, e.g.:

System A

Name
Prefix:
First Name: Beatriz
Middle Name: Compos
Last Name: Rocha
Suffix: MD PhD

System B

Name
Prefix: Dr.
First Name 1: Beatriz
First Name 2: Helena
Middle Name 1: de Souza
Middle Name 2: Compos
Family Name: Rocha
Suffix:



Terminologies Used in the 3M HDD

- Systematized Nomenclature of Human and Veterinary Medicine (SNOMED)/SNOMED Reference Terminology (RT) - Beta Test
- Unified Medical Language System (UMLS)
- Logical Observation Identifier Names and Codes (LOINC)
- National Drug Code (NDC)



Terminologies Used in the 3M HDD (Continued)

- International Classification of Diseases, 9th Revision, Clinical Modification (ICD9CM)
- Diagnosis Related Group (DRG)
- Current Procedural Terminology, 4th Edition (CPT4)
- HCFA Common Procedure Coding System (HCPCS)



Issues Encountered in Using Existing Terminologies

- Classification schemes versus controlled vocabularies
- Interface terminologies versus reference terminologies
- Incompleteness
- Errors
- Violation of principles
- Updates/versions
- Operation/support logistics
- Licensing/cost



The 3M HDD Solution

- Modeled after the UMLS
- Cross reference/map between controlled vocabularies and classification schemes
- Cross reference/map between reference terminologies and interface terminologies
- Supplements where incomplete
- Does not incorporate errors
- Deals with operation/support issues
- Submit concepts/terms to SDOs



How the 3M HDD Works - An Example

- Interface a customer's lab system to the 3M CDR
- 3M HDD uses LOINC lab result names
- Each LOINC lab result is a concept in the 3M HDD (with a concept identifier, analogous to the UMLS CUI (Concept Unique Identifier)), and the LOINC code is a synonym of the concept



An Example (Continued)

- Customer's legacy lab system uses proprietary interface codes and display names
- Required information is obtained from the customer to map each legacy code/name to a LOINC lab result concept (code) already in the 3M HDD
- The legacy code and name are two additional synonyms for the concept



An Example (Continued)

- If there is no existing match in LOINC/HDD, a new concept (lab result) is created in the HDD and the customer's legacy code and name are added as synonyms
- The LOINC name is submitted to LOINC for inclusion in the next version
- When the LOINC code is assigned by LOINC, it will be added into the HDD as a synonym for the new concept



Coordination Among Medical Terminologies

- Crosswalks and mappings
- Common definitions of concepts
- Convergence to a single reference terminology or model:
 - conceptually, not physically, e.g. LOINC for lab results, SNOMED for diagnoses
 - not necessarily the same SDO/database



Coordination Among Medical Terminologies

- Medical informatics principles are not the issue
- Reference terminologies are emerging/maturing
- Market is moving towards de facto standard terminologies, e.g. LOINC for lab results
- Market moving towards coordination, e.g. LOINC and SNOMED, SNOMED and Read Codes
- Government can lead by example, for instance, the Government Computer-based Patient Record (G-CPR) project, the Composite Health Care System II (CHCSII) project



End User Viewpoint

- 3M HDD is not the end user of terminologies
 - just the working product
- End user is the health care enterprise
 - **what can be done to bridge the gap between terminology development and end user?**
- Biggest problems are cost and lack of understanding
- Means to relieve the burden? Incentives? Education programs?
- Government funding for research, development and application?
- Coalition of terminology developers and users?