



Integrating SNOMED CT with other Meaningful Use vocabulary standards (LOINC, RxNorm, HCPCS, CPT-4) and billing terminologies (NDC, ICD-9, ICD-10) using the Unified Medical Language System (UMLS)

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Audience

Researchers and clinicians interested in next-generation phenotyping of clinical data across multiple ontology resources.

Objectives

To demonstrate how annotations on different clinical facts: phenotypes (SNOMED CT), medications (RxNorm), labs (LOINC), and procedures (SNOMED CT or HCPCS/CPT) can be brought together into a single perspective for exploration and querying of patient data.

Abstract

The *Meaningful Use* legislation, enacted as part of the ARRA/HITECH act of 2009, was designed to transform U.S. healthcare by advancing clinical processes and improving outcomes. As part of this process in the MU Stage 2 Final Rule, the Office of the National Coordinator for Health Information Technology (ONC) defined a common set of MU data elements and corresponding vocabulary standards, for which certification would be required across a number of EHR interoperability certification criteria.

SNOMED CT is poised to become the cornerstone of U.S. health information interchange as the mandatory terminology for encoding smoking status, problems, and procedures (here interchangeably with a combination of HCPCS and CPT-4 codes; and CDT or ICD-10-PCS as optional standards) within a patient record. Other parts of the electronic health record have their own designated standards, e.g., LOINC for labs, and RxNorm for medications. This already convoluted terminology landscape is further complicated by the disparity on the billing side of health information exchange, where SNOMED CT is not allowed, and ICD-9-CM is going to be replaced by ICD-10 in October 2014. However, all these terminologies are integrated within the Unified Medical Language System (UMLS) maintained by the U.S. National Library of Medicine.

To this effect, the Clinical Informatics team at the Medical College of Wisconsin has developed ClinMiner, a clinical research that incorporates data entry forms, patient reports, advanced querying and data visualization. Data for the system can be imported from a data warehouse or manually added through a set of curation forms; and are then standardized using SNOMED CT and other Meaningful Use terminologies, and integrated into a single UMLS perspective that allows for seamless and dynamic translation between the annotating sources, as well as provides a consolidated view of the underlying patient data.

This approach is unique in integrating SNOMED CT with other terminologies into a single workflow of a clinical application. A demo of the system (user: showcasedemo, password: showcasedemo) is available at:

<https://clinminer.hmgc.mcw.edu>