Mapping a Local Drug Interface Terminology to SNOMED CT

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Abstract

The use of standard terminologies is one of the requirements of interoperability among different clinical information systems. In healthcare, particularly with pharmaceutical products, controlled terminology is necessary. Pharmaceuticals have multiple components and controlled terminology plays a vital role in the exchange of information among different actors in the creation of a system of electronic prescriptions. The Hospital Italiano de Buenos Aires maintains an institutional database of pharmaceutical products at a national level. This work describes the process of mapping this knowledge base to SNOMED CT. This work is intended to describe the challenges encountered during the process of mapping of a reference terminology (SNOMEDCT) to an institutional database of pharmaceutical products (local drug interface terminology), who were created for the electronic prescription functionality in a large Healthcare Information System.

Keywords:

SNOMED CT, Interface terminology, Electronic prescription system.

Methods

The interface terminologies are systematic collections of clinically oriented phrases aggregated to support clinician's entry of patient information directly into computer programs, such as clinical documentation systems or decision support tools.

Local Information Model of Drugs

In order to implement an electronic prescription system in the EHR an information model was created. This model was designed to represent the complexity of local scenario of drugs in Argentina. The model describes the reality of the pharmaceutical industry, with laboratories that produce pharmaceuticals products, these products are marketed as individual presentation (also named manufactured formulation), containing a specific composition and packing. The composition of a presentation is equivalent to its **'Generic Drug'**, as defined by Argentine policies. The "Generic Drug" is related to the active components (ingredients) that make it up, the pharmaceutical form (dosage form) and the amount of each ingredient (strength). In the logistical level, many pharmaceutical products have different containers for the same "Generic Drug", and the interchangeability calculations were difficult. To address this, a model called "*Logistical Generic*" was created. This model includes the container of fluids or creams and allows for a better administration of the hospital stock. Since CT SNOMED CT concepts are organized in several major hierarchies; these hierarchies divide content by domains. Taking into account the components of both models (local model and SNOMED CT model of drugs), we proceeded to mapping them.

Results

The Local Model of Drugs in the Hospital Italiano required the inclusion of 2,280 drugs, 7,892 generics drugs, 477 pharmaceutical laboratories, 12,790 products and 26,594 individual presentations. The strategy used to implement the standard for pharmaceutical products of SNOMED CT to a local model was to map components of both models. The reality of the diversity in the Argentine pharmaceutical market showed the need to ad concepts in a local extension of SNOMED CT used in our institution. This has been provided by the terminology server.

Table 1 - Mapping of components of both models

Local drug model	SNOMED CT drug model
Ingredients	Substances
Dosage forms	Dosage forms
Generic Drug	VTM Subtype
Logistical Generic	VMP

Within the local model of drugs there are 437 drugs, of the total of 2,280, with 20 percent that were not represented in SNOMED CT, these drugs were modeled on a local extension of SNOMED CT.

Conclusion

The Local Model provides all the required functionality for the Hospital Information System of the Hospital Italiano, and it is the heart and soul of many existing software applications. The model of SNOMED CT provides a standard for the interoperability and extremely versatile capacity of aggregation, which allows grouping pharmaceutical products in accordance with multiple objectives.