

## Inheritance of SNOMED CT Relations between Concepts by two Health Terminologies (SNOMED International and ICD-10)

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### Abstract

The situation of medical coding and medical economics is quite specific in France. Besides ICD-10, two specific terminologies are used: the International Nomenclature of Human and veterinary Medicine (SNOMED International) developed by the College of American Pathologists and CCAM<sup>1</sup>. This work aims at creating and optimizing inter and intra terminology relations between ICD-10 and SNOMED Int.

As 91% of SNOMED Int. preferred terms (PTs) and 87% of ICD-10 PTs are present into SNOMED CT, via the UMLS<sup>2</sup> Metathesaurus, we explore the automatic inheritance of SNOMED CT relations (Finding Site of, Associated Morphology, ...) by SNOMED Int. and ICD-10 terms.

### Method

In a first step, we extracted all UMLS concepts linked by a SNOMED CT relation. For example, the two UMLS concepts C0000727, C0000726 are linked by the SNOMED CT relation "Finding Site of". In a second step, we mapped the SNOMED CT relations to two terminologies namely SNOMED Int. and ICD-10. As the terms of SNOMED Int and ICD-10 are also linked to the concepts found in step 1, we projected the relations found between the UMLS concepts to the ICD-10 and SNOMED Int. PTs. Finally, we obtained for each terminology a set of PTs pairs linked by the SNOMED CT relations.

### Results

We found a total of 264,216 SNOMED International PTs pairs linked via a SNOMED CT relation and 6,417 ICD-10 PT pairs linked via a SNOMED CT relation. We also obtained 114,036 pairs of one ICD-10 PT and one SNOMED Int.

PT linked by a SNOMED CT relation.

For example the ICD-10 term "Achondroplasia" (ICD-10 code: Q77.4) was linked according to the "Associated morphology" SNOMED CT relation to the term "Dysplasia, congenital" (SNOMED Int. Code: M-20020) and linked according to the "Finding Site of" SNOMED CT relation to the term "Bone" (SNOMED Int. code: T-11001).

### Conclusion

We have several perspectives in mind. The first one is to apply the same methodology to another health terminology (the MeSH thesaurus) which is the current terminology used in CISMef (a Web site dedicated to Catalog and Index Health Resources in French). The information retrieval algorithm using the relations that will be produced between MeSH terms could be very easily implemented in the CISMef Web site, (e.g. the relation "Adams Stokes syndrome" "Finding site of" "heart conduction system" could lead to expand or limit the initial query "Adams Stokes syndrome").

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<sup>1</sup>The French equivalent to the US CPT4

<sup>2</sup>We exploited the UMLS 2007AB