

# Nonsynonymous Synonyms: Correcting and Improving SNOMED CT®

Shelly K. Nash, DO

College of American Pathologists, Northfield, IL

## ABSTRACT

*SNOMED CT® was created from a merger of SNOMED RT® and United Kingdom's National Health Service's Clinical Terms Version 3. The resulting terminology has a plethora of synonymous terms. This paper discusses how a review synonyms in the Procedure section of SNOMED CT revealed some nonsynonymous synonyms, hypothesizes why errors in synonymy may have occurred, and explains the steps taken to resolve nonsynonymous concepts previously assigned as synonyms.*

## INTRODUCTION

SNOMED CT has approximately 325,000 concepts and more than 800,000 synonyms<sup>1</sup>. During the creation of the nomenclature individual modelers evaluated concepts and were allowed to merge two (or more concepts) from the source terminologies into one concept. One concept then became the name of the SNOMED CT concept and the other(s) became a synonym. As a result of this process many concepts in SNOMED CT have three, four or even more synonyms. As part of the quality review process an evaluation of all concepts with greater than two synonyms was performed. This allowed reevaluation of concept modeling and correction of errors in assigning nonsynonymous concepts as synonyms.

## DISCUSSION

There are 48,078 concepts in the Procedure hierarchy of SNOMED CT. A query found there were 5702 concepts with greater than two synonyms. Each of these concepts was then examined in the editing environment. Of these 5702 concepts 454 were found to have erroneous synonyms. This gave around an 8% error rate. A synonym was deemed erroneous if it did not have the same meaning as the concept to which it had been assigned. Examples of synonym errors were the following:

**Concept:** Operation on breast

**Synonym:** Breast procedure

**Concept:** Endoscopy of stomach

**Synonym:** Esophagogastroduodenoscopy

**Concept:** Transurethral destruction of lesion of Bladder

**Synonym:** Cystoscopic removal of bladder lesion

**Concept:** Local Anesthesia

**Synonym:** Topical local anesthesia

The majority of the synonym errors were due to a modeler assigning a more general concept as a synonym of a more specific concept, assignment of concepts with the word 'Procedure' as a synonym for concepts with 'Operation', or concepts with similar ideas being expressed but different methods being assigned as synonymous ('removals' being given synonyms of 'destructions'). Also, some of the erroneous synonyms were legacy issues, meaning that the errors in the assigned synonymy had been present before the creation of SNOMED CT. These incorrect synonyms were present in SNOMED RT or CTV3 and not corrected at the time of the merger.

Once these errors in synonymy were identified they needed to be resolved. A specific set of modeling steps were performed which involved "splitting" the synonym from the concept, creating a new concept for the synonym, and providing historical information to link it back to where it had originally been found in the terminology. The appropriate relationships, often an Is\_a relationship to the other concept, was created and the concept was fully modeled. For example:

**Topical local anesthesia**

**Is\_a :** Local anesthesia

**Operation on breast**

**Is\_a:** Breast procedure

## CONCLUSION

The review of synonyms in SNOMED CT did lead to the discovery of some significant errors. In the Procedure section this error rate was around 8%. Currently a review of synonyms in the Disorder section of SNOMED CT is underway and the error rate looks to be somewhat less. Maintaining a large terminology such as SNOMED involves not just adding concepts but correcting errors. As new concepts are added the hope is that they will be evaluated for problems or issues with synonymy and that in the future a much lower error rate will occur.

## REFERENCES

1. Spackman, K.A. SNOMED CT Unlocks the Power of Clinical Data. *Laboratory Medicine*, April 2002, Vol.33; 3-6.