201930 The Implementation of SNOMED CT in Chronic Obstructive Pulmonary Disease to Support Interoperability

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Summary

Our study aimed to develop a chronic obstructive pulmonary disease subset based on the SNOMED CT terminology and to assist in the exchange and comparability of COPD information.

Audience

Clinical, Research/Academic, Technical

Learning Objectives

1. how to develop a chronic obstructive pulmonary disease subset based on the SNOMED CT terminology;
2. how to implement SNOMED CT in the real data of china clinical system;
3. SNOMED CT terminology can support the interoperability of COPD.

Abstract

Background: Chronic obstructive pulmonary disease (COPD) ranked among the top three leading causes of death in China. Considering the high smoking rate, air pollution and smog in China, it is necessary to improve disease prevention and reduce disease burdens by COPD. While studies showed that information of COPD from electric health record (EHR) is not interoperable and cannot be re-used in different hospitals. Our study aimed to develop a COPD subset based on the SNOMED CT (Systematized Nomenclature of Medicine-Clinical Terms) terminology and to assist in the exchange and comparability of COPD information. Methods: The COPD-related terms were annotated from the 1400 COPD patients records by two colleagues with medical background using semi-supervised natural language processing (NLP). The extracted terms were classified and manually mapped to SNOMED CT by two terminologists. The results of the mapping will be used to develop a COPD subset. And 2-member respiratory expert panel validated 100% of the mapping.

Results: There were 8890 terms annotated by NLP from 1400 COPD patients' EHRs, in which 17.5% were considered useless for mapping to SNOMED CT. And most (83.5%) terms were divided into four groups, including condition group (CG), therapy group (TG), drug group (DG) and procedure group (PG) depending. The majority of the COPD-related terms (n=2774) were mapped to SNOMED CT concepts. And average mapping rate was 75%, among which, CG

(n=1161, 70%), TG (n=199, 65%), DG (n=280, 89%), PG (n=414, 85%) in SNOMED CT. The resulting set of mapped SNOMED CT concepts were 2071.

Conclusions: SNOMED CT is terminology currently recommended for use to facilitate interoperability and conduct research in certified electronic medical records. To support the interoperability of COPD information, the use of standard terminologies is an essential component. Our results showed that SNOMED CT contains most COPD concepts from real world data and is a useful standard terminology to assist the developing of subsets of COPD in EHRs. The strength of this study is clarified the true meaning of SNOMED CT implementation has started in china clinical system. It still needs more studies and more data to expand COPD subset and to build better medical information system for COPD.