201923 SNOMED CT and LOINC for computable phenotypes in Alzheimer's Disease

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Co-authors

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Summary

As part of a research project funded by the NIH, at University of Nebraska we have abstracted EHR datasets for patients with Alzheimers Disease, deployed SNOMED CT extension terminology to encode those datasets, and are developing statistical models for a computable phenotype for Alzheimers Disease.

Audience

Clinical, Research/academic, Policy/administration

Learning Objectives

1. Define the concept of "computable phenotype"
2. Appreciate the requirements and challenges of conducting observational research in Alzheimers Disease
3. Understand the value of electronic health record data encoded with SNOMED CT and LOINC in supporting research in Alzheimers Disease

Abstract

The era of genomic medicine has ushered in new avenues of research and is beginning to affect the clinical care of patients with neurodegenerative diseases including Alzheimers dementia. As part of an NIH funded project at the University of Nebraska we have been developing a research registry of patients with dementia and have been extending SNOMED CT and LOINC in support of a computable phenotype for Alzheimers disease. "A computable phenotype refers to a set of clinical conditions that can be evaluated via a computerized query to an electronic health record(EHR) or clinical data research network."[1]

From review of autopsy reports, clinical care documents, laboratory and radiologic tests retrieved from the EHR we have analyzed the terminology requirements and developed SNOMED CT terminology extensions to structure and encode the data elements necessary for the registry. We have authored these concepts, carefully employing the SNOMED CT concept model for Observable entities, Clinical findings and Procedures, in our Nebraska Lexicon® SNOMED CT extension. The scope of work at this time includes ten standardized clinical questionnaires, 45 coded pathology findings from the neuropathology autopsy and dozens of testing results from laboratory, genetics labs and

radiology. We are currently preparing a statistical analysis of historical findings for 150 patients with dementia in order to develop a logistic regression model for the computable phenotype of patients with Alzheimer's dementia.

Reference Documentation

[1]Richesson RL, Hammond WE, Nahm M, Wixted D, Simon GE, Robinson JG, et al. Electronic health record based phenotyping in next-generation clinical trials: a perspective from the NIH Health Care Systems Collaboratory. J Am Med Inform Assoc. 2013;20(e2):e226–31.