

Improving a UMLS based Allergy List for Use in Live Electronic Medical Record Systems

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Abstract: The SNOMED allergy subset available through the UMLS has a variety of deficits that are substantial barriers to use in live clinical practice. These authors describe a method of enhancing a UMLS based allergy list by combining concepts from other terminologies found within the UMLS. This method resulted in a three-fold increase in the coverage allergy list compared to the standard SNOMED allergy subset.

Objective: Fundamental barriers in the UMLS vocabularies have barred practical use in live clinical environments. Such barriers include dialectical limitations (“Lasix allergy” and “Furosemide allergy” is absent, whereas the British “Frusemide allergy” is present), incomplete content coverage (fewer than 4,000 elements in the allergy subset – yet there are more 13,000 medications alone to which a patient can be allergic), and lack of brand name mapping (only generic names are available).

One important facet of having a comprehensive, clinically relevant allergy list is related to the capture of data in a live EMR. Comprehensive pick lists allow accurate and standardized data capture at the moment of data entry and limits the need for free-text entry. These authors describe a method of increasing the number of allergy list concepts by using existing concepts from a variety of UMLS terminologies.

Methods: UMLS Category 0, 1, and 4 vocabularies were used in assembling the enhanced allergy terminology list. The list included concepts from RxNorm, SNOMED CT, and VANDF. Concepts for the allergy list were built through the following process: (1) All trade name medications in RxNorm were extracted; (2) All trade name medications were associated with their generic equivalents (e.g. Lasix allergy – Furosemide allergy); (3) All generic medications were extracted from RxNorm, and VANDF; (4) Algorithms were used to extract all specific allergies in SNOMED CT; these algorithms captured both the SNOMED-CT allergy subset elements, as well as allergies not catalogued in the allergy subset; (5) All Radioallergosorbent Test (RAST) sensitivity results were extracted and processed into concepts for the allergy list; (6) Duplicate entries in the comprehensive list were removed; (7) For all concepts with an existing SNOMED CT hierarchy, the hierarchy was associated to the allergy concept.

Results: The final NIMI allergy terminology list consisted of 14,784 allergy concepts representing a greater than three-fold increase from the SNOMED CT allergy subset alone. The allergy list was put into clinical use in the electronic medical record (EMR) system Azyxxi, used across seven hospitals in the national capital region. The NIMI allergy terminology list has allowed clinicians to capture and document UMLS based allergy concepts in a standardized fashion within the EMR and across the enterprise.

Discussion: Selective algorithmic extraction from existing UMLS terminologies is a viable means to establish a clinically practical allergy list for use in EMRs.