

POSTER ABSTRACTS

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A Knowledge-Based Information Retrieval System (KBIRS)

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Background: The push for providing high quality healthcare based on the “evidence” has caused many clinical information systems developers to begin exploring ways to provide clinicians with access to clinical reference and patient education materials at the point of care. For a given care situation, the availability of vast amounts of patient-specific clinical data and generally applicable clinical knowledge often makes identification of the most relevant information for a particular patient difficult, if not impossible, for the patient or even the clinician. We have developed a prototype system capable of taking a copy of a patient’s electronic medical record, which includes their current clinical problems, medications, and laboratory test results among other clinical data, and automatically generates a set of highly relevant, condition and patient-specific educational documents.

Methods: Briefly, KBIRS takes as input a copy of a patient’s electronic medical record in an emerging HL-7 standard format called the Clinical Document Architecture (CDA). It then uses a condition-specific knowledge model created using the Protégé knowledge modeling software to identify key concepts and relationships from the patient’s data. For example, it may identify that a patient with asthma has recently been started on a new corticosteroid. An algorithm, using additional clinical knowledge, then converts this set of facts and relationships into a query that can be run against a standard web-based patient education resource (e.g., Healthwise) to identify and retrieve one or more patient-specific documents.

Results: We have recently completed end-to-end testing of a prototype that includes clinical knowledge to interpret an asthma patient’s clinical record and recommend relevant documents. The system has been developed entirely using freely available open-source software tools and techniques. Preliminary results of running the system suggest that the system performs as well as patients with intermediate level internet searching capabilities.

Conclusions: We believe that such a knowledge-based information retrieval system illustrates the future of emerging trends in clinical knowledge-management and distributed clinical computing. Bringing context-dependent clinical knowledge to bear at the right time and place to help clinicians and patients make the right decision is one of the key factors in facilitating patient-focused clinical decision making.