Prošireni sažetak / Extended abstract

Konceptualizacija medicinskog znanja u području zatajivanja srca: HEARTFAID projekt

Conceptualization of medical knowledge for heart failure management: HEARTFAID project

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Conceptualization of medical knowledge means collection of relevant medical knowledge and its systematization. The knowledge must be presented in the form that may be used by machines and easily updated by humans. Motivations for doing conceptualization of medical knowledge are manifold and they include: integration of patient data from various sources (semantic integration), intelligent monitoring and early warning systems (decision support), integration of medical knowledge of different specializations, ubiquitous availability of best medical practice, intelligent data analysis for evidence based medicine.

Ontologies are today accepted as the most appropriate form for knowledge formalization. At the basic level they present a dictionary of relevant concepts that are ordered in a hierarchical structure called taxonomy. The distinguishing characteristics of ontologies are properties connecting the concepts and representing relations like "indicated_by" and "may_be_treated_by". Basic classes of the developed heart failure ontology (HF, available at http://lis.irb.hr/heartfaid/ontology/) are "HF_concept", "Patient_characteristics", "Testing", and "Treatment". These basic classes include in total 200 subclasses and 2,000 instances representing relevant medical concepts and about 100 properties connecting these concepts. Whenever possible the used concepts are with CUI numbers (Concept Unique Identifiers) connected with UMLS (Unified Medical Language System, http://www.nlm.nih.gov/research/umls/) a large, publicly available medical taxonomy.

The HF ontology represents descriptive knowledge about the heart failure domain. Knowledge should enable also to perform some actions, typically in the form of suggestions for patients and medical personnel. The knowledge representing sufficient and necessary conditions that some actions can be done is the so called procedural knowledge. An example of procedural knowledge is the rule: Diagnosis of systolic HF IF patient has either HF signs or HF symptoms AND abnormal ECG (left bundle branch block AND anterior Q waves) AND patient has (ischemic heart disease) AND Chest X-ray abnormal (cardiothoracic ratio >0.5) AND natriuretic peptides abnormal (BNP >100 pg/ml). HF procedural knowledge has been divided into 10 functional sub-tasks like diagnosis of HF, severity assessment of HF, and
težine, lijekovi i kontraindikacije. Namjera je bila omogućiti jednostavniju ljudsku kontrolu kompletnosti i konsistentnosti uvjeta. Konačno, u izlaganju će se pokazati kako se u ontološkoj formi mogu integrirati deskriptivno i procedurno znanje i kako se takav formalizam može iskoristiti u primjenama pomoći u odlučivanju.

Ključne riječi: prikaz znanja, ontologije, pomoć u odlučivanju.

Literatura