Arden Syntax: current state, experience, and trends for executing medical knowledge in intensive care

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Abstract

Nowadays, clinical decision making is increasingly based on a large amount of patient medical data, on continuously growing medical knowledge, and on extended best clinical practice guidelines. There is evidence that clinical decision support systems can significantly improve quality of care in, eventually, all areas of clinical medicine [1]. Technically, suitable means to formally represent clinical knowledge and to connect decision support algorithms with patient data sources in a seamless way are prerequisites for successful clinical decision support applications. Arden Syntax, as an internationally standardized formal language for medical knowledge representation and processing [2,3], was implemented as a clinical decision support server and equipped with service-oriented interoperability [4]. It has already proven useful in a number of clinical areas [5]. An example for extended clinical decision support in infection control is given by Moni/Surveillance-ICU, a system for the early recognition and the automated monitoring of hospital-acquired infections in intensive care units with adult patients [6–8]. This knowledge-based system includes concepts of fuzziness to formally represent medical lin- guistic terms. The European HELICS criteria for hospital-acquired infections [9] form the basis of its knowledge base; results are given in form of degrees indicating to which extent the HELICS definitions are fulfilled by the patient data taken into account. Arden Syntax, or its extended form Fuzzy Arden Syntax [10, 11], seems highly suitable for developing clinically useful decision support systems.

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