

iCARDEA - an Approach to Reducing Human Workload in Cardiovascular Implantable Electronic Device Follow-Ups

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More than 800,000 patients in Europe have an implanted cardiovascular implantable electronic device (CIED) today, causing 5.8 million follow-up visits for patients per year, and both numbers are quickly rising. This calls for new methods of long-term surveillance with a view to optimizing patient safety and care, alleviating the burden of caregivers, and lowering health care costs through IT support. The iCARDEA Project aims at developing an intelligent platform to semi-automate the follow-up of CIED patients using adaptable computer interpretable clinical guideline models. For this purpose, data from hospitals electronic health records (EHR), from patient maintained personal health records (PHR) and the CIED device readouts themselves, provided by the remote monitoring services offered by all major vendors for the current generation of devices, are collected and correlated. The CIED data is provided in or converted into a vendor independent standard format (based on the IHE Implantable Device Cardiac Observation Profile), and EHR and PHR data are converted to HL7 Clinical Document Architecture (CDA) format. This permits CIEDs from multiple vendors as well as different health record systems to be connected to the iCARDEA system. The PHR component furthermore enables patients to take an active role in the management of their own health-care. Patients can manage their medication summaries, dietary information, prescriptions, etc. through the system and receive educational information and feedback. Furthermore, the correlated data from all sources is presented to the caregivers in an intelligent way to reduce the workload. The data presented is enriched by automatically generated patient-specific warnings and suggestions based on statistically valid patterns extracted using state-of-the-art data analysis techniques applied to reference case knowledge bases. The article describes the approach and system architecture of this project, which has started in February 2010.