Development of an Information System Based in Electronic Health Records (EHR) to Support Decision Making in Emergency Rooms

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Emergency rooms services are places where, day by day, vital decision are taken, such that can represent success or failure, just with a thin line of separation. There are many factors described that can affect the capacity of decision-making and giving support to this process is essential.

Historically information systems had been so expensive especially in the development, fortunately today there are a lot of open source – free distribution tools to support this kind of proposals. The axis of a clinical information system to support decisions is the medical record in self. An EHR was developed with interface Web Browser orientation seeking dynamic behaviour. We used PHP was as base language, with some support of javascript and MySQL as Data Base Management system.

A "transactional model" was implemented where there is a definition about clinical data to be collected named as "events", which are in charge of control the data behaviour. It was possible to identify 375 single events. Each event is classified in one of nine types of event according with how data are collected and showed. Is this order of ideas a health record is a set of transactions or events stored chronologically from which is possible to reconstruct all the patient history. There is a set of tables that supports the "knowledge" of system that includes vademecum, CIE-10 (ICD-10), handling guidelines, among others. The system is data driven focused in initial form, diagnosis and order entry.

Then there is an informatics tool that can be released under GNU license, able to handle clinical data from patients in an emergency room, and adaptable potentially to any kind on place depending of definitions made in transactional model. That incorporates alerts to errors, helps to orient the physician and presents alternatives to be followed contextualized.

Development of a Web Based Lexicon Tool for Spanish Language

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The Hospital Italiano of Buenos Aires is a University hospital, in Buenos Aires, Argentina. Since 1998, a full Hospital Information System (HIS) was developed. More than 120,000 ambulatory visits and more than 2,000 inpatient episodes are processed each month using our Electronic Medical Records (EMR).

Physicians enter diagnosis information in the EMR as narrative text, without restrictions, later a group of trained coders assign standard vocabularies codes to those text descriptions, using ICD-9-CM, ICD-10, ICPC and SNOMED.

In order to perform automatic codification of diagnosis text descriptions a lexicon was designed. A lexicon is a software application that processes strings eliminating inflections, derivations, acronyms, etc., and obtaining a new reordered, normalized string, composed by the "base forms" of each word.

This tool is used to compare different strings with the same meaning and assign diagnosis codes by repetition, which is if "Back pain" and "Painful back" share the same base forms "back pain", both of them should be represented with the same code in any given vocabulary.

To achieve this goal an emulation of the Specialist Lexicon of UMLS was performed, as reported in other languages (German and French). Initially more than 40 lexical rules in Spanish had to be created form scratch, and lengthy tables of synonyms, derivations, articles, etc. had to be filled.

Conclusion: A prototype was created using J2EE technology, is published on the Internet, and is tested and maintained by several collaborative groups in different centres around the country.

Medical Program Administrator: A Study and Functional Analysis of Software for Follow-Up and Control of a Patient Population with Chronic Diseases

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Purpose: To perform an investigation of needs and a functional analysis of software for follow-up on a population of patients with chronic diseases and their contacts with the Medical Program, using records from existing medical information systems (CPR, Admission, Appointments, etc.)

Methodology: Anecdotes (Storyboards), Use Cases and Activity Diagrams were used for UML documentation.

Basic Definitions: The Medical Program Administrator is a software package that manages a patient population with chronic diseases in order to schedule for each patient and enable the follow-up of Medical Program contacts with the patients, with priority based on patient risk. It includes as well a defined clinical practice guide for the treatment of chronic diseases.

Design: A system that integrates various medical information system patient data was designed to perform follow-up on patients based on their risk. The system automatically detects those patients for which clinical (results of practices and procedures) or attitudinal (adherence to treatments, consultations, etc.) parameters were incongruent with the expected values as defined in clinical practice guidelines. Based on this selection process, which users can adapt and customize, the system generates patient contact lists, and these in turn generate e-mail reminders for patients. Scheduling can be done by patient or by patient group, as can be the definition of control objectives, and the system adapts automatically to the clinical parameters and the performance of examinations and procedures, allowing for a personalized follow-up of patients. This software, like other medical information systems, has been developed in a web based format and can be integrated into the institutionalet.

Conclusion: The Medical Program Administrator is a system that analyzes patient data from various medical information systems, allowing for a personalized follow-up of each patient, and which automatically orients Medical Program resources toward those patients of greater risk. This enables better treatment of chronic diseases, thereby contributing to a decrease in morbidity and mortality and an improved quality of life in this population.