

Information System for Pharmaceutical Management using Clinical Risk Groups

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Abstract. INTRODUCTION: The economic impact of patients with chronic conditions is of paramount value, 10% of patients spend 70% of health resources. Since the 60's the pharmaceutical expenditure has been increasing due, among other reasons, the aging population and the consequent increase in chronic conditions. The current economic situation and this scenario make it a priority to open and develop innovative pharmaceutical management lines. The Valencian Health Department (VHD) spends around € 2,000m per year on medicines and health products, including ambulatory and hospital pharmacy. The management and pharmaceutical expenditure is a priority within health budgets. Moreover, the VHD has developed a powerful Electronic Health Record (SIA) and electronic prescription System (GAIA) under the Abucasis Project. They make available to the corporation different applications in more than 3,400 primary care centers, specialty care centers, hospitals and pharmacies, being used by about 20,000 users between clinicians and managers. 6,951,660 medical records are housed, of which 5,129,388 are active and correspond to the population covered. In order to improve the control of pharmaceutical expenditure in the strategic, tactical and operational level, and to improve the clinical management of patients, a data mining project was launched as part of the prescription program (GAIA), aimed to managers and clinicians. This project results in an application called Patient Classification System of Valencia (SCP-cv), which is analyzed and provided with the necessary information for health management, allowing management of pharmaceutical expenditure adjusted by morbidity and the prioritization of patient's medicine-related problems (MRPs) management, according to clinical risk at the macro, meso and micro level. This paper provides an approach to application development, emphasizing on the analysis phase of the model and in the classification and implementation of the management application for a movement of basic clinical data from a population of 5,129,388. We present data sources and hospital outpatient, the process of integration,

the classification system and the integration of the application as part of the electronic medical record systems and the electronic prescribing ambulatory and technologies used to develop the project, including the use of clinical grouper 3M™ Clinical Risk Grouping Software.

OBJECTIVE: Presentation of SCP-cv software tool for the analysis of pharmaceutical expenditure adjusted by morbidity of patients and their clinical management, focusing on aspects related to information technology. **DESIGN:** Observational, cross-sectional retrospective.

METHODOLOGY: The phases of information system development are:

1. Integration of different repositories variables in a specific database: To perform the analysis, the sources of data from medical record systems and electronic prescribing application were entered into a classification based on the CRG. Later, a SQL database was developed, where all information was integrated, including the results of the classification, which was obtained with the final classification model.
2. Classification of patients based on Valencian Community CRG: Each patient recorded in the EHR was classified in a mutually exclusive CRG group. Thereafter, a pharmaceutical expenditure predictive model was validated.
3. Development of a pharmaceutical cost management of patients: Presentation of information about pharmaceutical monthly consumption by CRG and deviation from the model predictive values.

RESULTS AND CONCLUSIONS: Resulting information system provides information about consumption in different levels of aggregation. The first level is used for the analysis of pharmaceutical expenditure due to morbidity and clinical risk patients. This allows us to analyze the evolution of expenditure of each CRG monthly and yearly. Second level of aggregation we accessed to information related with patients with a higher level of pharmaceutical expenditure to allow the optional filter by priority action: high-medium-low, in order to guide the patients for which the corrective action will be more beneficial. Third level of aggregation refers to the EHR selected patients (Patient Management). This level provides both data of outpatient and inpatient. Finally, fourth and final level allows filtering patients by EDC's (Episode Disease Category), or PCD (Primary Chronic Disease).

Classification of patients in the Valencian Community (Spain), attending to their morbidity and clinical risk through the SCP-cv tool using clinical grouper 3M™ Clinical Risk Grouping Software aims to be the key to make a qualitative and health management leap. The main condition for an organization to develop a classification of this type and allow a detailed analysis of health expenditure according to the disease weight of citizens, is the existence of EHR and electronic prescription systems. These tools must provide clinical individualized, integrated and high level of implementation and warning systems. A diagnostic quality prescription system that allows a solid data volume for at least two years must be used. Develop such a project is advisable to use existing information technology and tested capable of enabling both internal and external validation.