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Creating a Drug Knowledge Database for Integration into a Health Information System

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The management of a large amount of data about drugs is particularly complex. It is known that prescribing drugs is a major source of error in medicine. Also, the information about drugs, their mode of use and possible adverse effects, are some of the most needed data by professionals and patients. The clinical prescription order entry (CPOE) systems are emerging as a solution to this problem, but to integrate knowledge drug databases to these tools and the Health Information Systems is not an easy work. The structure and representation of drug databases by international standards could be the answer to achieving the integration of scientific knowledge to clinical systems. On this basis the Hospital Italiano de Buenos Aires decided to conduct a validation process of different sources of drug information in order to create a base of knowledge structured and controlled by international standards.

For building the knowledge base of drugs, the Hospital Italiano worked with a multidisciplinary team to design and the structure of this base. This data organization, structure and representation through international standards should be useful to the health information system that can be integrated and used for clinical decision support systems. It should also facilitate the tasks of data management related to drugs and research processes.

Build the team: The first step in the design and structuring of the knowledge base was to create a multidisciplinary working group that works in order to review the data available in different bases and validate the structure of the database and the content.

Select information sources: During the discussion process and building the foundations multiple information sources were evaluated to find the most appropriate for each of the fields that were deciding. The consulting databases are flexible, in other words, depending on the type of drug, a literature search was performed and the data are prioritized according to the level of evidence and scientific rigor with which they were published.

Structure of the base: Information on each drug was structured in specific fields, and the data entry was organized in Family of Drug and Drug. Thus, the drug inherits the information entered in the family. Anyway all fields can be edited, because not necessarily every drug inherits the general structure of family functioning.

Terminology Control: To facilitate interoperability between healthcare information systems international standards for representation of medical knowledge as ATC and

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SNOMED CT were used. In turn, each drug was mapped with national codes of classification terminologies (national nomenclature coding of Argentina – ANMAT) and the Mesh code to optimize the process of updating the information.

The development and implementation of this database involved information gathering, structuring, validation and updating drug by drug, requiring the coordinated efforts of multiple services and disciplines. One of the major difficulties is that most commercial databases are in English, so the already difficult task of structure and integration of the different sources, is added the task of translation and interpretation. The cost of these bases, which is high for most institutions facing such projects, but even more considering that often is needed to hire one or more databases in order to complete the data base. Another challenge is the validation and updating of information. Have valid and current information about drugs, structured and controlled with international standards of representation of medical knowledge enabled and facilitated the process of generation of support tools for physicians and patients, optimized process management of information on drugs and we believe has the potential to increase patient safety.