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A Medical Decision Support System on Drug Interactions Vasile V. Anestiadi, Zinaida G. Anestiadi Center of Pathobiology and Pathology, Academy of Sciences, Chisinau, Republic of Moldova

Introduction: Medical practice often involves simultaneous administration of several pharmacological agents. These drugs may interact among them in various ways, thus changing the desired effects. We have considered appropriate to create a Decision Support System (DSS) on drug interactions, for the use of physicians wishing to administrate multiple drugs. **Materials and Methods:** For the implementation of the DSS, Prolog has been used, running on a standard PC. There has been collected information on drug interactions. The database thus created contains information on interactions of 62 drug classes. Each interaction between 2 classes is characterized by interaction grade, type and direction. The grade can be mild, moderate or severe. The type of interaction may be 'possibility of interaction', 'increase of the effect', 'decrease of the effect', 'toxic', 'deadly effect', 'isolated case'. The direction of interaction may be 'none', 'first drug', 'second drug', 'both'. Thus the main Prolog database contains predicates of the form drugs(Atom, List1,List2,List3,List4), namely, drugs(DrugName, Interactions, Grades, Types, Directions). Thus every atom Atom is associated with 4 lists, List1..List4. List1 contains a list of atoms associated with Atom. The lists List2, List3, List4 contain atoms, characterizing the association between Atom and the elements of the List1. The length of lists List1..List4 is the same, but not constant, because it is possible to add new atoms or to delete the existing ones. **Results:** There has been created a program consisting of 5 modules. The DSS has proved to be of use in cases when several (up to 12) drugs have been administered. An individual pharmacologic agent (drug) can be added to the database, deleted from the database, renamed, copied, verified. The program permits to load a database, save a database, empty a database, sort a database, export database for use in other programs. The interactions for a combination of up to 12 drugs are shown in a 2-dimensional scheme, permitting to assess very rapidly the grades, types and the directions of the interactions. **Conclusions:** The DSS has proved to be useful for the optimization of multiple drugs therapy.