

Abstract

AIDA builds an expert system with a knowledge base derived from transfusion guidelines by the Polish National Blood Centre¹. An Expert System is defined as an interactive and reliable computer-based decision-making system which uses both facts and heuristics to solve complex decision-making problems. It is considered at the highest level of human intelligence and expertise. It is a computer application which solves the most complex issues in a specific domain. Such system is based on a knowledge base describing domain knowledge acquired from human domain experts.

Our system will enable to check if the patient who has the need for a transfusion meets the criteria in the guidelines.

Originally, we wanted to create a machine learning-based system, using retrospective data on transfusions in clinical hospitals. However, we encountered a problem with a large discrepancy in the issue of compliance of physicians' decisions at equal levels of education and experience. Therefore, we decided to base our system on guidelines prepared by top-class experts.

We decided to create an expert system due to the fact that knowledge base and the processing mechanism are two separate components and execution is done logically and heuristically. In this paper we will evaluate correct operation of the system by assessing a retrospective database of Polish clinical hospitals regarding transfusion patients. On the basis of the cases selected by the system in which the applicable guidelines were not followed, an analysis will be carried out that will show the costs incurred by the health care system.

Currently, we are comparing the differences in the decisions of doctors and our system in one of the leading medical centers in the country. Then we will introduce our system to the hospital in one of the wards, where we will divide the doctors into two groups. The study group will use our tool to make decisions about transfusions. The second group will be our control sample. After 30 and 90 days we will assess the clinical and economic impact of our tool.

1) <https://www.ncbi.nlm.nih.gov/pubmed/28035775>