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Stanford Project: REFERENCE Project

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The goal of this project is two-fold: (a) use existing AI methods to implement an expert system that can critique medical journal articles on clinical trials, and (b) in the long term, develop new AI methods that extract new medical knowledge from the clinical trials literature. In order to accomplish (a) we are building the system in three stages.

1. System I will assist in the evaluation of the quality of a single clinical trial. The user will be imagined to be the editor of a journal reviewing a manuscript for publication, but the program will be tested on a variety of readers, including clinicians, medical scientists, medical and graduate students, and clerical help.
2. System II will assist in the evaluation of the effectiveness of the treatment or intervention examined in a single published clinical trial. The user will be imagined to be a clinician interested in judging the efficacy of the treatment being tested in the trial.
3. System III will assist in the evaluation of the effectiveness of a single treatment examined in a number of published clinical trials.

Collaborative Project Abstracts

National AIM Project: Computer-Aided Diagnosis of
Malignant Lymph Node Diseases (PATHFINDER)

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We are building a computer program, called PATHFINDER, to assist in the diagnosis of lymph node pathology. The project is based at the University of Southern California in collaboration with the Stanford University Medical Computer Science Group. A pilot version of the program provides diagnostic advice on 80 common benign and malignant diseases of the lymph node based on 150 histologic features. Our research plans are to develop a full-scale version of the computer program by substantially increasing the quantity and quality of knowledge and to develop techniques for knowledge representation and manipulation appropriate to this application area. The design of the program has been strongly influenced by the INTERNIST/CADUCEUS program developed on the SUMEX resource.

SOFTWARE AVAILABLE ON SUMEX

PATHFINDER-- A version of the PATHFINDER program is available for experimentation on the DEC 2060 computer. This version is a pilot version of the program, and therefore has not been completely tested.

National AIM Project: RXDX Project

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We are developing a prototype expert system that could act as a consultant in the diagnosis and management of depression. Health professionals will interact with the program as they might with a human consultant, describing the patient, receiving advice, and asking the consultant about the rationale for each recommendation. The program uses a knowledge base constructed by encoding the clinical expertise of a skilled psychiatrist in a set of rules and other knowledge structures. It will use this knowledge base to decide on the most likely diagnosis (endogenous or nonendogenous depression), assess the need for hospitalization, and recommend specific somatic treatments when this is indicated (e.g., tricyclic antidepressants). The treatment recommendation will take into account the patient's diagnosis, age, concurrent illnesses, and concurrent treatments (drug interactions).

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