THE USE OF THE COMPUTER IN GASTROENTEROLOGY
FOR DOCTOR-TRAINING AND PATIENT-DIAGNOSIS

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ABSTRACT

This paper introduces the various types of clinical problems which present to the
Gastroenterologist and goes on to describe how an Expert System can help in the
diagnosis and thence indicate the appropriate remedial action. The package can
be used for the training of students and house-men and can also be used by the
most senior clinicians as a decision-support tool.

INTRODUCTION

One must recognize that the early work in the field of gastroenterology and computers
was done by Card [1]. This was then taken up by de Dombal [2] and subsequently
on a much wider scale by additions to the database through the efforts of de Dombal
and his colleagues [3].

The Therapeutic Chair at the Medical Institute in Sverdlovsk and the Operations
Research Department of the Institute of Mathematics and Mechanics (Ural Branch
of Academy of Sciences of the USSR) together with the Computation Department of
The University of Manchester Institute of Science and Technology are also carrying
out researches on Artificial Intelligence systems in gastroenterology with the aim
of diagnosis and education.

The value of a careful interview and physical examination of the patient is still
of great importance in the diagnostic process in gastroenterology. Information
Technology can assist doctors (especially beginners) in their training and in
improving the diagnosis.

Such a package would enable the recruits to gain experience via the computer, whilst
for their more experienced colleagues it would serve as a second, or even a third,
opinion when they were performing in the absence of their consultant.
GASTROENTEROLOGY

Very often the doctor in General Practice cannot carry out the detailed examination procedures necessary to diagnose correctly the cause of abdominal pain. However, such examination procedures are of extreme importance in Gastroenterology. Most of the typical gastroenterological diseases may be recognised using traditional methods when used by a skilled specialist [4].

Usually when the General Practitioner has found signs of gastroenterological disease he refers the patient to the Consultant Gastroenterologist for an expert opinion (diagnosis) and a recommendation as to a course of action (treatment). Such a two stage procedure makes the wait for a diagnosis somewhat lengthy. Such problems are exacerbated in District Hospitals who do not have a resident Consultant in Gastroenterology. It is felt that these problems may be solved by the use of a computer programme for decision support.

THE AIMS OF THE INVESTIGATION

The main aims governing the production of this computer package have been three in number viz:

(i) To create a model for the training of the recruits in the technique of interviewing patients and obtaining their medical history, and in the techniques of examination procedures.

(ii) To have a computer system which can be used to assess the clinician's performance, ie to carry-out a medical audit.

(iii) To produce an Expert System capable of performing as good as the Consultant, or a team of Consultants.

Therefore such a computer package must prompt the doctor during the patient interview and examination, and take in the answers to the questions; it must make decisions based on pre-determined rules; and it must explain why it has arrived at those conclusions. In this way the junior doctors can learn from the package and can thereby advance in knowledge and skill as a result of the logic built into the programme. Also, the use of a structured history-taking questionnaire has previously been shown to be of enormous value.