ABSTRACT. The concepts of categorical diagnosis and conjectural diagnosis are introduced. It is argued that in diagnostic reasoning conjectural diagnosis plays a more important role than categorical diagnosis. Attention is called to the inevitable vagueness of clinical language and to the suitability of epistemic logic and fuzzy logic for diagnostic reasoning.

Key words: Categorical diagnosis, Conjectural diagnosis, Epistemic attitudes, Epistemic kinematics, Epistemic logic, Approximate clinical reasoning.

1. INTRODUCTION

On the basis of [17], categorical and conjectural diagnoses are distinguished in Section 2 of this paper. It is shown that the diagnostic process is characterized by epistemic kinematics. This discussion may prove useful in understanding the normative nature of medical diagnostics. One conclusion, for example, is that the so-called 'logic of diagnosis' cannot be weaker than epistemic logic. Because of the inevitable vagueness of clinical language, however, even epistemic logic is an insufficient tool for diagnostic reasoning. This problem is briefly outlined in Section 3.

2. CATEGORICAL AND CONJECTURAL DIAGNOSES

In ordinary philosophical discussions about diagnosis and diagnostics one does not usually have a clear idea of the role that diagnosis plays in clinical decision-making. Almost every statement about the ‘diseased state’ of the patient put forward by the physician is viewed as a diagnosis, and thus it is commonly assumed that in general treatment is motivated by, and based on, diagnosis. I am, however, of the opinion that most therapeutic decisions are based on conjectural diagnoses, i.e., statements about the patient which the physician merely conjectures or believes to be true. The empirical substantiation of this opinion would imply that (i) the physician’s individual epistemic attitudes are an integral part of clinical practice; (ii) he needs an appropriate epistemic logic which might help him in his diagnostic conjecturing; (iii) we need a new concept of misdiagnosis; and (iv) culpability and malpractice claims become more difficult to judge.

In the following, I shall sketch the distinction between diagnosis and conjectural diagnosis. To this end some terminological conventions should first be introduced.¹
2.1. Some Epistemic Notions

Statements will be symbolized by Greek lower case letters α, β, γ, etc. The variable ‘t’ denotes any point in time, and ‘x’, ‘y’, ‘z’ are variables representing arbitrary individuals. The negation of a statement α is written ‘Not α’. If α and β are statements, ‘α and β’ is called a conjunction, ‘α or β’ an alternation.

Let α be any statement, e.g., ‘David suffers from whooping cough’. The class of epistemic attitudes that an individual x at a particular time t may have toward α, entails the following four main types and their negations: (1) ‘x at t knows that α’; (2) ‘x at t is convinced that α’, i.e., ‘x at t is certain that α’; (3) ‘x at t believes that α’; and (4) ‘x at t considers it possible that α’. The latter can be defined by (2) as ‘x at t is not convinced that Not α’. All other epistemic modalities can be reduced to these four main types. An epistemic statement is simply a statement which contains a sentence of the form (1)—(4). Epistemic statements containing only sentences of the form (2)—(4) are also called doxastic statements.

Let us abbreviate ‘x at t knows that α’ by K(x, t, α); ‘x at t is convinced that α’ by C(x, t, α); ‘x at t believes that α’ by B(x, t, α); and ‘x at t considers it possible that α’ by P(x, t, α). These four predicates, K, C, B, and P, belong to the class of modal operators and are said to be ‘epistemic modalities’. The latter three are also called ‘doxastic modalities’. I will not define these four three-place modal predicates here. It suffices to be aware that they refer to epistemic attitudes of individuals, and that the intension of an epistemic statement of the structure V(x, t, α) is a particular mental state of the individual x, where V represents any of the four modalities K, C, B, or P. Moreover, the sequence K-C-B-P symbolizes an inclusion relation and decreasing certainty. ‘Knowing that’ includes ‘being convinced that’; the latter includes ‘believing that’; and this includes ‘considering it possible that’. The converse does not hold.

2.2. Categorical Diagnoses

Assume that a particular physician’s diagnostic opinion about a patient is ‘I consider it possible that the patient suffers from the disease so and so’, whereas he is not yet convinced that the patient suffers from this disease, i.e., that he is not yet convinced that the statement ‘the patient suffers from the disease so and so’ is true. I do not think that in such cases of lack of conviction it would be appropriate to view the physician’s opinion as a diagnosis. A doxastic statement of the structure P(x, t, α) is compatible with the opposite doxastic statement P(x, t, Not α). According to the latter, the physician in the example above might also be of the opinion ‘I consider it possible that the patient does not suffer from the disease so and so’.