ABSTRACT. Ethical problems are related to computer data bases, containing data on individuals and groups of persons, as well as to computer knowledge bases, containing general rules and elements of expert systems.

In the present essay the following conclusions are made regarding computer data bases: privacy, security, and confidentiality of medical computer data bases should be ensured. This duty should rest with physicians in hospitals. The principle of informed consent should be applied to gathering information which is to be stored and processed by computers. Information stored in computer data bases should not be used for purposes for which the subjects (patients as well as personnel) have not given their consent. In order to decrease the possibility of misuses of medical data bases containing information on individuals, these registers should not be linked to other central data bases.

Among the ethical problems connected with computer knowledge bases two types may be distinguished: (a) responsibility of experts for truthfulness and adequacy of factual statements, and (b) effectiveness and proper foundations of directives for action. As computer knowledge bases constitute a part of clinical consultation systems, they are closely connected with the process of decision making by doctors. The problem of use in computer knowledge bases (and consultation systems) of factual statements and directives for action should be further discussed from an ethical point of view. The practical usefulness of consultation systems which would contain only factual statements would be rather restricted. However, they would be “safier” from an ethical point of view. Systems in which hints for action constitute an important element are more powerful, but raise also more ethical problems.

Key words: Computer consultation systems, Computer data bases, Computer knowledge bases, Computer registers, Confidentiality, Data security, Decision making, Directives for action, Ethics, Expert systems, Factual statements, Personal registers, Privacy.

1. INTRODUCTION

The aim of the present essay is to review some ethical problems related to medical computer information bases, i.e. data bases and knowledge bases. In the field of application of computer methods in medicine, it is difficult to separate ethical problems from general methodological ones and therefore these two domains are closely interwoven in this paper.

The use of computers becomes wider and wider almost every year, and people, legislators, and governments are more and more aware of dangers presented by these powerful tools. Nationwide regulations in this field have been enacted in several countries, as for example in Great Britain, France, and Canada. As concerns medical informatics, the “Statement on the Use of Computers in Medicine” has been issued by the World Medical

Association. In numerous papers various ethical aspects of computer applications in medicine have been analysed and other sources indicated. A West European framework for national legislation is provided by the Council of Europe Convention for the Protection of Individuals with regard to Automated Processing of Personal Data.

2. COMPUTER INFORMATION BASES

Medical computer information bases may be divided into two types: (1) data bases and (2) knowledge bases.

Computer data bases contain information on (a) individual, identified persons (in a general case — various objects) or (b) groups (classes, sets) of people (objects). Data bases of both kinds store and process information on particular facts (in contra-distinction to general laws), i.e. features characterizing individual persons (e.g. every identified patient in a hospital ward) or individual persons as members of a group. In the latter case it is the class (group) which is identified and the attributes of its elements (individual persons) are important only as components of the description of the class.

Computer knowledge bases principally differ from the data bases. They do not contain information on particular facts, i.e. on objects’ features or events which have occurred in a certain time, but are composed of general statements, i.e. laws and rules which constitute elements of a certain fragment of science or practical know-how, e.g. medical. Among knowledge bases, two types may be distinguished: (a) bases which contain statistical laws, i.e. statements which are generalizations of quantitative experience, and (b) bases the components of which are extracted from natural knowledge in a given field; they contain general statements in categorical as well as imperative form, i.e. laws sensu stricto and rules for action.

First, I shall discuss briefly the ethical problems connected with data bases and then, in more detail, those which pertain to knowledge bases.

2.1. Computer Data Bases

Typical application of data bases concerning individual, identified persons (personal bases or registers) consists in storing information on patients treated in a given centre (clinic, hospital ward, out-patient department) and using it for purposes of diagnosis, therapy, prevention etc. The possibility of misusing this information, i.e. of somebody using it for other,