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ON COMPUTER-BASED PATIENT RECORD

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Abstract. The Committee on Improving the Patient Record by the Institute of Medicine (IOM) of the National Academy of Sciences in the USA has presented a report (1991) which described the basic concepts on computer-based patient record (CPR).The necessity of computerize the patient record was obvious many years ago.There is still no computer-based patient record in wide-spread use that fully replaces paper chart.

In Romania there was some programs which tried to solve this problem begining in the seventies.There is a specific Romanian healthcare environment.We developed an application destinated to manage the patients evidence in any kind of medical unit, in Sintec ltd. software company.

THEORY

The shortcomings of the paper medical record (PMR) are well known.The most important are:poor organization,incompleteness and inaccuracy.The necesity of computerize the patient record was obvious long ago.Yet,there is still no computer-based patient record in wide-spread use that fully replaces paper chart.The majority of physicians still use paper medical records because they perceive it more suitable for their task.

IOM committee has identified some important strenghts of paper medical record:their use requires no special training, they are portable, they allow flexibility in data recording and they can easily be browsed through and scanned.A computerized medical record must exploits the strenghts of computers without loosing the advantages of the paper medical record.

According to the IOM committee, the computer-based patient record systems should:

- contain a problem list;
- support systematic measurement of health status and functional level;
- document the clinical rationale for patient care decisions;
- link to other clinical records across settings and across time to provide a longitudinal record;
- provide comprehensive confidentiality safeguards;
- offer easy access to authorized users;
- allow selective retrieval and formatting of information;
- link to local and remote knowledge,literature,bibliographic or administrative databases and systems;
- assist in the clinical problem solving process;
- support structured data collection and store data using a defined vocabulary as well as support direct data entry by practitioners;
- aid in the management and evaluation of quality and costs of care;
- be flexible and expandable.

The term "computer-based patient record" conveys two important aspects:

- the record is focused on and integreted around the patient;
- the record is not only computerized (automated version of paper medical record) but it is computer-based.

The structure of CPR can be addressed from three major point of view:as the user perceives it, the structure of the underlying database, and the structure of the conceptual model behind the CPR application.

The main categories of data wich occur in patient record are: demographics,problem lists,signs and symptoms,test results,current medications,assessment,and plan. All these can also be divided in:observations,interpretations and decisions.It is important how the data in the record is related.Ambiguous descriptions and missing data may hinder proper interpretation.Therefore semantics need to be added to the data in the record.

An important aspect of patient data is the temporal one. The time-stamping of patient data is important because the patient record essentially involves the recording of events over time.Time may be expressed as an absolute expression,as a relative expression or as a duration.There are two important time-stamps who may be recorded: the moment the event happened and the moment it has been recorded.Sometimes proper interpretation is possible only when there is a third time-stamps indicating when the data become available or was assessed.

The simplest model for the representation of patient data is a table that defines by which attributes a particular entity may be described.This model is rigid because a change to a table requires adjustments in the application and redundancy may occur.
A second, more flexible one, is a knowledge model that consists of a predefined vocabulary and of knowledge about how the terms of that vocabulary may be combined into meaningful expression.
An actual patient data is the instantiations of that knowledge.This type of knowledge may be represented by the conceptual graphs formalism.A third approach is to structure the patient records with the purpose to facilitate browsing through patient data.

There are two basic strategies in data entry:natural language processing (NLP) and structured data entry(SDE).Since it involves free text,NLP offers maximum expression capability and the physicians do not have to change the way in which trey choose their phrasing.The extrating of much structured data from such sources is complicate.SDE involves the selection of terms from a predefined vocabulary.It is a good way to enhance completeness of data, but the expression capability is intrinsically limited.In this case the

versatility is very important for user-acceptance.The standardization of data is extremely important in sharing data among different institutions.Therefore an important goal is to establishe better coding schemes.

The leadership for CPR development is the Computer-based Patient Record Institute(CPRI),a non-profit membership organization with representation from throughout health care.There are five main work groups in this institute:

- Codes and Structures;
- Confidentiality;
- Privacy and Security;
- Systems Evaluation;
- Professional and Public Education;
- Description.

ROMANIAN HEALTHCARE ENVIROMENT

In Romania there was some applications for patient records management begining in the seventies. All these was designed based on the specific hardware infrastructure existing:Romanian computers PDP-11 compatible working under RSX operating sistem.One of the best was implemented at Borşa hospital (Maramureş District).There are still about 30,000 patient records in such a database.

In the ninties the enviroment in wich CPR advances are being made has changed significantly.Yet,there is still insufficient hardware infrastructure and financial support for CPR research, development end implementation.Obviously, there are no financial incentives provided for physicians to use CPR system. National policy in CPRS lags.

There are no national standards able to assure confidentiality, security and accuracy of CPRS and other health data sets.

A new medical assistance system will be introduced and a new concept:family doctor.

The patients that,according to the law, benefit by medical

assistance should freely chosse the physician.It is an important foreward step in Romania healthcare reform.

PRACTICE

We designed an application destinate to manage the patients evidence, in Sintec ltd. software company."SAN" is useful in any kind of medical unit (surgery,circuit,polyclinic or hospitals).It was designed with respect to all legal settlements.The program is available in seven versions, depending on the medical unit type and configuration,ranging from the most simple one (private surgery) to the most complex one (hospital with polyclinic,chemist's and circuits).

The simplest version is an adequate solution for a private surgery.It provides a set of tools to put on the computer this kind of activity, both the medical and the economic aspects of it.The physician can therefore concentrate on the medical act rather than on the birocratic part of his activity.

From the medical point of view the patients evidence is fully covered.From the moment of the first examination all the informations about the health condition of a patient are stored in the patient's record and they can be easily retrieved at any time. From the economic point of view the physician can define his own prices for the medical acts and can obtain the costs for any patient,at any time.

The program is also a kind of personal agenda for the physician.The storage and processing of images (X-ray for example) are possible.The physician can store here different pieces of medical knowledge in order to build his own thesaurus which he would have at hand at any time.The data gathered in the main files of the program can be used to obtain personal statistic reports.

The most complex version is dedicated to hospitals.It is designed to work in a local computer network.Data integrity, data security and patient confidentiality are assured.Although don't meet the need of all settings recommendend by IOM committee "SAN"

offer a set of standard functions that meat these criteria.

This application was instaled for the first time on the Borsa Hospital computer network.It is also in use to Baia Mare Districtual Hospital and other Romanian hospitals and also in some private surgery.

The program was developed in FoxPro 2.6 and C++.

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