

Implementing Electronic Medical Record in Family Practice in Slovenia and Other Former Yugoslav Republics: Barriers and Requirements

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SUMMARY

The author describes problems related to the implementation of electronic medical record in family medicine in Slovenia since 1992 when first personal computers have been delivered to family physicians' practices. The situation of health care informatization and implementation of electronic medical record in primary health care in new countries, other former Yugoslav republics, is described. There are rather big differences among countries and even among some regions of one country, but in the last year the situation improved, especially in Montenegro, Serbia and Slovenia. The main problem that is still unsolved is software offered by several companies which do not offer many functions, are non-standardized or user friendly enough and is not adapted to doctors' needs. Some important questions on medical records are discussed, e.g. what is in fact a medical record, what is its purpose, who uses it, which record is a good one, what should contain and confidentiality issue. The author describes what makes electronic medical record better than paper-based one (above all it is of better quality, efficiency and care-safe, easier in data retrieval and does it offer the possibility of data exchange with other health care professionals) and what are the barriers to its wider implementation.

Keywords: electronic medical record; primary health care; quality of care; advantages; barriers; requirements

INTRODUCTION

Medical record keeping is an art and also a skill. A medical record in general practice/family medicine (FM) is a structured notebook containing data about a patient, his family, life situation and health problems, management and encounters. For many decades paper was used to record patient's data [1]. In the 60's of the last century more structured medical record was suggested [2]. In the last two decades of the 20th century electronic medical records (EMR) were introduced [3]. For many years general practitioners/family physicians (FPs) have faced different barriers in the regular use of EMR; technical, personal and content based barriers: e.g. incompetence in the use of computer, doctors' attitudes, lack of computers, lack of quick internet and intranet connections, costs, limited software capacity, unsafe software, incompatibility of different e-systems, etc. [4, 5]. However, technology and software production have improved enormously and we are now in the situation where EMR can be much better than paper records.

SITUATION IN SLOVENIA

In Slovenia already in 1992 the Institute of National Health Insurance supplied all FPs with personal computers (PC) – approximately 900. Unfortunately, the installed software fulfilled only the needs of this Institute; collected data were mostly used for financial purpose, only partly for analytical purpose, but was not used in FP everyday work; thus, it was used only by nurses or practice receptionists for financial and administrative purposes. Additionally, at that time the majority of the FP staff was not skilled in computer use. Thus, these PCs were used only by prac-

tice nurses or receptionists. Several software companies started to develop software that could be also useful in FP and the management of patients. Mostly, they were not user-friendly and were not completely compatible with the existing software. The majority of physicians working in FP were not satisfied with the software, because it did not offer enough support in everyday work and did not fulfil expectations. These software companies did not consult FP professional organizations as in some other countries, e.g. the Nederland [3]. Some FPs tried to develop their own software, but without success, e.g. Zrimšek [6]. In the late 90's the Ministry of Health wanted to establish a national public software company that would develop a uniform users' friendly and helpful software, but the result was unsuccessful.

Now, a rising number of FPs have a PC on the desk, and not only practice nurses. In the last years, since Slovenia has joined the European Union, several companies offered new and better EMR but again they did not consult national FP professional organisations to collaborate in preparing software that would be accepted by the majority of FPs. None of these companies has tried to unite and prepare at least compatible and usable software. But now, there is a new challenge for these companies. Slovenia has become the partner of some EU research projects on EMR (e.g. „RIGHT”). In the meantime, the Institute of the National Health Insurance started to implement information system aimed at on-line connection of all health care levels (primary, secondary and tertiary). At the same time, several national small projects on electronic data exchange started to develop, and also the Medical Chamber of Slovenia joined in the efforts to create a good EMR for PHC (primary health care) which could be partly connected to other medical data at the National Health Information Centre [7].

Also, the Ministry of Health has been running a complex project „E-health” since 2005, which also includes e-documentation [8, 9]. This EMR should be finalized in 2010. All these efforts have the goal to connect all health professionals and enable exchange of medical data, as well as patient’s individual health insurance smartcards. Access to these data would be enabled to health professionals by their professional smartcard, protected by the Personal Identification Number (PIN). If these projects will not be implemented in the near future, sooner or later software companies from other European countries that have already experience and references in this field will offer their software to our FPs, although they will have to adapt them because of very different information systems in the European countries [3].

SITUATION IN OTHER FORMER YUGOSLAV REPUBLICS

In Bosnia and Herzegovina (Table 1) there are some minor differences among the regions, but the great majority of FPs do not have a PC in their practice. However, some FPs use three different software that give them some support (e.g. allergy alert, recall system), but without any local intranet connections. There were few local pilot studies done on the secondary health care level, but without long-term results. For now, there is no official federal global strategy or country plan for the overall informatization of primary health care (PHC) or all health care levels [10].

Also, in Croatia (Table 1) there are problems in the implementation of EMR in primary care, because of similar barriers as in Slovenia and other countries, although much effort has already been put into the informatization of health care, and its national program exists [11, 12]. Now, there is a number of different software used, but unfortunately they do not offer enough help to FP (e.g. drug interactions alert, electronic clinical guidelines incorporation) and still a lot of FP do not want to use them regularly. Maybe they would be keener to use EMR if it was more helpful as shown a few years ago in some successful projects [13, 14].

In Macedonia (Table 1) not many FPs have a PC on their desk and there are some basic software that cannot replace paper medical records, but there are no published papers on this topic in Macedonia (personal communication). In this year the Ministry of Health has started a project on personal health smartcards for citizens and health professionals [15], but there is no published exact country plan for the informatization of PHC.

In Montenegro (Table 1), in this year a new complex EMR has been introduced in PHC which will gradually replace paper records. In this first phase it is used for all patients’ data, their daily care and communication with all PHC services and pharmacies, including electronic prescription. The data may be seen only by authorised health care workers. In the near future this EMR will also offer help for everyday work (e.g. allergy and drug interaction alert, clinical guidelines, etc.). For the next year the Ministry of Health together with the National Health Insurance plan funds to implement awarded integral health information system for full electronic connection of health care system, and all communication in PHC, in secondary and tertiary health care, and also among all other levels [16, 17].

In Serbia (Table 1) there are differences across the country. In the last 15 years there were individual or local attempts (which are not always compatible) to implement EMR with different success. Somewhere all FPs already use EMR and do not use paper records any more, but in other parts hardly any of FPs have a PC on their desk [18]. In 2005 the Ministry of Health with support of the World Bank and EU started a project on the computerization of health care system in Serbia. Until now some objectives have been achieved; central national information centre connected to local centres around the country, e-basis of insurance for total population, software for registration of patients in hospitals and PHC. Software for the management of all medical data in PHC should be available in the near future. There is a country plan for further computerization at all levels of health care and also EMR [19].

WHAT IS REQUIRED TO ACHIEVE A GOOD MEDICAL RECORD?

Who will convince the majority of FPs (which are still sceptical on everyday use of PCs for recording data) to replace paper-based medical records with electronic ones? Professional societies of FPs should support and recommend the FPs friendly software which could present enough advantages compared to paper-based medical record and which could offer answers to old but still very important questions:

1. What in fact is a medical record?
2. What is the purpose of keeping medical records?
3. Which is a good medical record?
4. What should a medical record contain?
5. How to insure the confidentiality of data?

Table 1. Situation in former Yugoslav republics – informatization of health care

Country	Official country strategy on informatization of health care	Use of PCs in PHC settings	EMR fully helpful for patient management
Bosnia and Herzegovina	No	Few FPs use PC	No
Croatia	Yes	Almost all FPs use PC	No
Macedonia	No	Few FPs use PC	No
Montenegro	Yes	Almost all FPs use PC	No, but in development in near future
Serbia	Yes	Some or many FPs use PC (big regional differences)	No, but in development in near future
Slovenia	Yes	Almost all FPs use PC	No, but in development in near future

1. What in fact is a medical record?

A medical record is [4, 20]:

- Doctor's notebook for better management of patient's problems
- Place for patient's medical documentation
- Continuous note on patient's health problems and management
- Professional and legal document of performed examinations, investigations, interventions and therapies
- Collection of patient's personal data and data about his family
- Judicial medical document
- Documents for professional supervision
- Documents for financial supervision
- Register of patient's chronic problems
- Register of past therapy, orthopaedic devices, referrals
- Register of long-lasting therapy
- Register of patient's sick-leave
- Resource for doctor's self-assessment
- Resource for educational tasks
- Resource for research work.

2. What is the purpose of keeping medical records?

Most answers to the first question are at the same time the answers to this question. It is important who uses the medical record and what it will be used for [20]. First of all, it is the doctor himself who uses the record. If properly kept, the record can be one of the crucial elements of the good management of a patient. From the beginning the record provides the physician with a series of patient's data, his illnesses, attendances and possibilities of prevention [1, 21]. But, it could be also used by a locum colleague, a medical student or a trainee, FP's team members or other health care providers, a researcher, a reviewer from a professional association or insurance company, sometimes attorneys representing the patient, attorneys defending the FP, occasionally by court of law and also by the patient himself.

3. Which is a good medical record?

As before, a part of the answer to this question is included above. A good medical record in FM facilitates longitu-

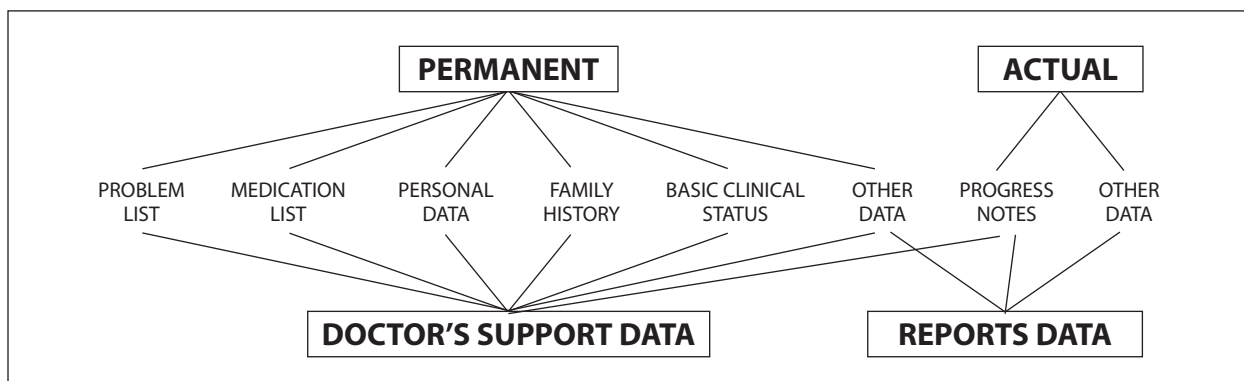
dinal and continual care, coordination, preserving data about the patient; it can be a good tool for the evaluation of health care quality, for analytical purposes and also for research [22-25]. It is an overview of the patient's life-style related to health. It should fulfil at least two criteria: it must be a comprehensive, lasting record of relevant information about the patient, and data entry and retrieval must be easy [1, 20].

There are many relevant topics that a good medical record should contain to accomplish its purpose. For example, illness history and physical findings of daily notes should support doctor's diagnostic plans and treatment; it should be evident that the patient is informed about abnormal results of diagnostic procedures and that appropriate follow-up is provided; it should contain the content of counselling, after-hours advices and informed consent for the procedures provided; also, it should be evident that the service provided justify the fee charged to the patient or to an insurance company, etc.

It is very important that data entry and retrieval are easy, because time is a very important element of FP's work regarding the appointment system and even for FPs that do not use such a system. The structure of the medical record should enable quick, simple, reliable and complete entry of data, diagnostic and specialists' reports, and at the same time also quick and reliable retrieval of the records. The patients' problem list should be evident. For patients with chronic diseases (e.g. diabetes, hypertension, and alcoholism) a good medical record should enable the physician to monitor its progress over time without looking at numerous daily notes for previous blood pressure readings or blood sugar level and other risk factors [26]. It should enable a quick overview (e.g. for the last ten years) of check-ups, performed diagnostic procedures, referrals, sick-leaves, prescribed medication, immunisation, preventive procedures, etc. The daily dosage and the amount of prescribed medication for chronic diseases should be legibly and evidently documented if the patient requires additional medication.

4. What should a medical record contain?

As before, the answers to previous questions contain a part of this answer. A medical record contains actual, dynamic and permanent data (Scheme 1).



Scheme 1. Data in patient's medical record

Overall, there is in fact a large amount of data which could be important in the management of the patient throughout his lifetime. If FP is aware that input of all data and also their retrieval is quick and easy, this will result in increased willingness to take time to document them. All data have to be well structured and easily approached. Regarding actual data and progress notes, the old but still very good SOAP system could be used [27, 28]. The structure of permanent and actual data should also enable a quick and reliable approach to previously performed examinations and investigations, FP's decision-making process, patient's problems over time and their management, health promotion, referrals and counsel with FP's team members [29].

5. How to insure the confidentiality of data?

Data access should be very limited. The patient has to be informed which professionals are authorized to reach his data and he should be asked to give his agreement. There are simple physical barriers to access paper medical records by location and different modes of storage. With EMR there are no physical barriers when the PC is turned on and connected to intranet or internet. A series of different electronic ways exist so as to prevent access by unauthorized persons. Such barriers are used by banks, governments, military and others, and are usually relatively safe for PC data or on the professional network and also for sent data.

In Slovenia, like in most European countries, the owner of the medical record is patient's FP, however, the patient is the owner of the stored information. The data may be given to other doctors (as well as a student or a trainee) or to any other person only by patient's permission – informed consent [30, 31]. The only exception is a special expert appointed by the court of law, who can have access to such data by court order, without the patient's permission.

Electronic medical record vs. paper-based version

Paper-based medical records are a good tool for the requirements described in the above five questions if they filled-in with data thoroughly and regularly, in a structured way and legibly. There are already EMR that are at least as good as old paper-based ones [32]. However, nobody would probably lose time and spend money on something that is not better.

Thus, what can an electronic medical record offer that a paper-based version cannot or can only do it to a reduced extent?

Many papers have been published giving answers to this question. There are many benefits of using a good EMR from individual and also public health point of view. Most of them are related to better quality, efficiency, safety of health care, easier retrieval of information and maintenance of age, sex

and disease registers; for example, better communication between different health care providers (laboratory, primary – secondary health care, etc.) [30, 33-36], safer and better prescribing of drugs [13, 30, 31, 34, 37, 38], better chronic disease management and the continuity of health care [25, 34, 35, 38, 39], facilitation of decision-making process [34, 39-42], health care planning [43, 44], research [43-46], and the possibility of even reducing costs [46].

Some studies have shown that EMR can also have a negative trend; e.g. reduction in the quality of record keeping of individual consultation or hospital health care [46, 47].

At the same time, many studies have shown that numerous FPs in different countries, similar to FPs in Slovenia and other new countries, are still reluctant to the full use of EMR in spite of its possible benefits [33-36, 40, 48-52]. Many barriers for the full use of EMR have still not been overcome, although most of them have been known for years: incompatibility of different e-systems [30, 36, 48, 51], financial costs [25, 30, 36, 49, 51], limitations of FPs' skills [36, 41, 51], FPs' and counselling teams' time consumption [30, 36, 41, 49, 51], and FPs' attitudes [30, 51]. One of the most complex issues that can be an important barrier is confidentiality of data of the EMR, especially if patients' data are shared between PCs or stored on a national electronic server or spine [43, 45, 51, 53]. In such situations the access to these data should be very limited using different systems – e.g. a password or a professional smartcard [25, 54], but even then there is a possibility of data misuse. If safeguards of the confidentiality of patient' information are not sufficient, then both patients and their FPs will not use the electronic spine, and data in such EMR will not be complete [27, 55].

CONCLUSION

The overview of situation on EMR in Slovenia and other former Yugoslav republics shows that until now no software has been introduced that would be close enough to all known possibilities of a good EMR, although there are some very good electronic health care systems already implemented or will be in the near future. Thus, many FPs are not prepared to lose time and make effort for the full use of PCs at their everyday work; in some countries there is even no possibility to do it because of the lack of PCs in their practices. In Slovenia, the Society of Family Physicians supports only such software which can overcome the barriers and which can take into consideration new improvements and factors that can facilitate EMR adoption [30, 40, 56, 57], e.g. standardised and compatible software at all levels of health care, high-tech solutions, financial support, incentives for quality improvement, "pay-for-performance" programmes for using EMR, graduated implementation, technical support, interactive education and close cooperation with FPs. If governments would show the will to implement a full use of EMR in PHC, similar conclusion can be made regarding all countries.

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Примена електронског здравственог картона у Словенији и другим бившим југословенским републикама: препреке и захтеви

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КРАТАК САДРЖАЈ

Објашњени су проблеми у вези са применом електронског здравственог картона у амбулантама породичне медицине у Словенији од 1992. године, када су све амбуланте лекара породичне медицине добиле компјутере. Описује се и каква је ситуација информатизације здравственог система и стање примене електронског здравственог картона у примарној здравственој заштити у другим бившим југословенским републикама, где се могу видети велике разлике између појединих земаља, па и између појединих регија у истој земљи. У последњој години ситуација се доста побољшала, нарочито у Црној Гори, Србији и Словенији. Главни проблем, који још није решен, јесу различити програми (софтвери) за електронски здравствени картон који немају многе функције, нису стандардизовани,

нису довољно *user-friendly* и прилагођени потребама лекара. Расправља се о важним питањима везаним за здравствени картон, као на пример: шта је заправо здравствени картон, шта је његов циљ, ко употребљава овај картон, који картон је добар и шта би требало да буде у њему, те проблем тајности података. Објашњава се због чега је електронски здравствени картон бољи од старог, папирног здравственог картона (бољи квалитет рада, ефикасност, безбедност рада, лакше проналажење података и могућност размене података међу стручњацима у здравству) и које су препреке његове шире примене.

Кључне речи: електронски здравствени картон; примарна здравствена заштита; квалитет неге; предности; препреке; захтеви