Minimal Data Sets in Primary Health Care and Electronic Family Data Carrier

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Abstract

Medical documentation is a very important part of the medical documentalistics and is occupies a large part of daily work of medical staff working in Primary Health Care. Paper documentation is going to be replaced by electronic cards in Bosnia and Herzegovina and a new Health Care System is under development, based on an Electronic Family Registration Card. Developed countries proceeded from the manual and semiautomatic method of medical data processing to the new method of entering, storage, transferring, searching and protecting data, using electronic equipment. Currently, many European countries have developed a Medical Card Based Electronic Information System. Three types of electronic card are currently in use: a Hybrid Card, a Smart Card and a Laser Card. The dilemma is which card should be used as a data carrier. The Electronic Family Registration Card is a question of strategic interest for B&H, but also a great investment. We should avoid the errors of other countries that have been developing card-based system. In this article we present all mentioned cards and compare advantages and disadvantages of different technologies.

Key Words:

Primary Health Care; Minimal data sets; Electronic Health Card; Smart Card; Laser Card; Hybrid Card

Özet

Tıbbi belgeleme biliminin en önemli bölümü tıbbi belgelemedir ve birinci basamak sağlık hizmetinde çalışan sağlık çalışanlarının günlük iş yükünün önemli bir kısmını oluşturur. Bosna-Hersek'te kağıt yerine elektronik kartlar kullanılacaktır. Elektronik Aile Kayıt Kartı tabanlı yeni bir sağlık sistemi geliştirilmektedir. Gelişmiş ülkeler elektronik teçhizatı kullanarak tıbbi verinin geleneksel ve yarı otomatik işlenme yöntemlerinden daha yeni veri giriş, iletim, tarama ve koruma yöntemlerine geçmektedir. Günümüzde, pek çok Avrupa ülkesi tıbbi kart tabanlı Elektronik Bilgi sistemleri geliştirmiştir. Kullanımda olan üç tür elektronik kart vardır: Hibrid Kart, Akıllı kart ve Lazer Kart. Hangi tip kartın kullanılması gerektiği konusunda sıkıntı vardır. Elektronik Aile Kayıt Kartı Bosna-Hersek için stratejik bir karar olmakla birlikte, aynı zamanda büyük bir yatırımdır. Kart tabanlı sistemler geliştiren diğer ülkelerin hatalarını tekrarlamamamız gerekir. Bu makalede sözü edilen kartlar hakkında bilgi vermeyi, farklı teknolojilerin avantaj ve dezavantajlarını karşılaştırmayı amaçladık.

Anahtar Kelimeler:

Birinci basamak sağlık hizmeti; Minimal veri setleri; Elektronik sağlık kartı; Akıllı Kart; Lazer Kart; Hibrid Kart

1. Introduction

Objective of this study is to recommend principles for medical documentation and evidence in PHC in B&H examining three areas: Current documentation and evidence in PHC system which is almost all taken over from the previous regime, recommendations of the European Conference for Medical Informatics held in Rome in October 2003 and short overview of electronic data carries with suggestion of an optimal option for B&H PHC system [1-3].

Also, we will stress out importance of medical documentation for general practitioner, as well as for society, which results with more economic and efficient health care and satisfied and "healthier" patients [4, 5].

Appropriate, comprehensive, available, accessible and timely information is a prerequisite for achieving of objectives foreseen by health care system reform and providing of health care services of high standards. Good information systems are based on speed and efficient flow of high quality information, shared by several users. The primary health care is not an exclusive matter of an individual, but also of a wider community, requiring teamwork in an organized multi-sector approach that allows continuous monitoring of the health status of the population in time, space and according to the specifics of certain areas.

Equipping primary health care institutions with modern Information Communications Technologies was, and still is unsystematic and depends on desires and knowledge of individuals. What we miss today, is unanimous definitions, standards, data collections, indicators and reports, which require not only highly developed culture of monitoring and evaluation, but also development of capacities and abilities to support and maintain such culture [5-8].

2. Medical Documentation

2.1. Definitions of Medical Documentations

As per definition of International Federation for Documentation (FID) 1962 documentation is: «collecting and keeping, classification and selection, spreading and use all aspects of information», and «Summary of activities which ensure continuous and scientific processing of content of all kind of documents with objective to spread information including emission, transmission, accumulation, selection, dissemination and absorption of information [5, 7].

2.2. Medical Record

Medical record is data set of patient which enables his/her health protection in present and future, based on registered past events, its evaluation and planning. In other words, medical record is very important component of efficient administration and planning of patient's health care. Good medical record must have the following characteristics [3, 4]:

- To clearly identifies owner of the medical record;
- To be understandable for all users;
- To be exact, concise and logic in its organization;
- To be standardized;
- To be reachable and easily browsed when necessary.

All of above is in regards to all medical documents, but here, we mainly think on basic medical data carries – Medical records and Anamnesis.

2.2.1. Functions of Medical record

As per WHO recommendations the main functions of a medical record are:

▪Help in patient treatment, Educational and self educational tool for medical workers, Data source for scientific researches, Data source for statistical reporting, Data source for medical management, Starting base for quality assessment, Legal aspect of medical record.

Medical record must be standardized to accomplish all mentioned. Due to a large number of technologies, applications and standards, which are used in the processing of information in PHC, standardization is very hard to achieve. Information systems of health must be based on open, compatible and standardized elements. It is necessary to define standards, which will represent a framework for conception, design and realization of development of the PHC and health information system in Bosnia and Herzegovina.

Increased demand for collection, analysis, reporting, transfer and exchange of the health information and the development of telemedicine, caused a rise in the needs for application of international standards in medical information technology with a special emphasis on the development and implementation of standards such as CEN/T251, Advanced Informatics in Medicine (AIM), American National Standards Institute (ANSI), International Standard Organization (ISO), International Electro technical Commission (IEC). Communication standards should ensure delivery and reception of digital messages with sensitive medical data through a network. These standards include:

1. Methodology for development of health science,
2. Standards for administrative messages,
3. Standards referrals, requests, clinical reports and discharges,
4. Standards for exchange of laboratory data,
5. Standards for exchange of medical images,
6. Standards for exchange of signals (e.g. ECG).

2.3. Medical documentation in B&H PHC

Current documentation and evidence in PHC system is in accordance with proper legislative, rules, regulations and acts regulated by appropriate institutions (Ministry of Health FB&H, Federal Public Health Institute etc.). The fact is that almost all medical document and questionnaires for evidence are "copied" from previous regime. It caused situation where is impossible to adapt current documentation to the present processing, analysis and interpretation and also, made use of all these information for health managers unattainable.

Family record

VK 01-02	Family members - general data
VK 03	Anamnesis data
VK 04	Anamnesis data - child
VK 05	Anamnesis data - spouse
VK 06	Anamnesis data - worker
VK 07	Anamnesis data - chronic patient
VK 09	Socio-economical family status
VK 08	Medical examinations in ambulance
VK 10	Doctor's visits

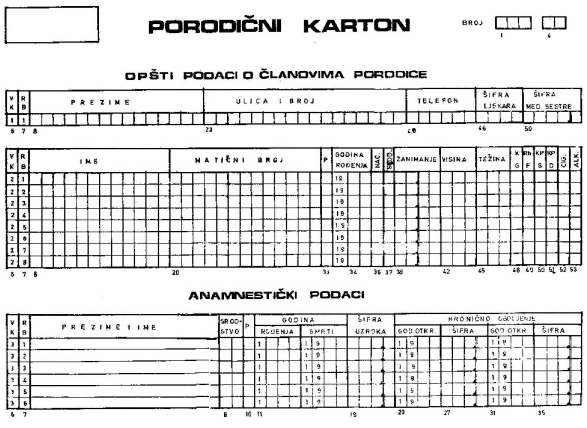

Figure-1.

2.3.1. Processing Methods

There are three groups of the data processing methods: manual, semi computerised and computerised. Criteria how and why to chose one of these methods are: data quantity to be processed, processing complicate, time of processing, processing costs and requests of stakeholders. Any data to be properly used and interpreted must go through the following phases of the processing: collecting, recording, control, grouping, coding, sorting, tabling and at the end analysis and interpretation of the data.

To accomplish all above, we need computerized data processing. Basic medical document should be medical record, and due to easier manipulation we recommend it to be in an electronic form.

3. Recommendations of European Federation of Medical Informatics (EFMI)

European Federation for Medical Informatics Conference was held in Rome, in October 2003, with special aspect to electronic medical record. (Clinical data sets for continuity of care and evidence based medicine).

Automatic processing of clinical data could be very useful for general practitioner, as well as for health care management. Patient –general data could be easily transferred to other doctor or t other level of health care (PHC, specialists, hospitals, etc.). On this way it is ensured continuous health care, avoiding repeating and duplicating diagnostic tests previously done. EFMI (European Federation for Medical Informatics) recommendation for a type of anamnesis [7, 8]:

Table-1.

Type of Anamnesis	History of Current Illness	Status	Family/Social Anamnesis
Problem focused (short)	Description of 1-3 elements of current illness or 1-2 chronic or inactive conditions	b/o	b/o
Problem focused / extended option (short)	Description of 1-3 elements of current illness or 1-2 chronic or inactive conditions	Clinically confirmed, positive or negative	b/o
Detailed	Description of at lest 4 elements of current illness or 3 chronic or inactive conditions	2-4 systems	At least one element from any category.
Comprehensive	Description of at lest 4 elements of current illness or 3 chronic or inactive conditions	Clinically confirmed, positive or negative, at least 5 systems in relation to the illness	At least one element from 2-3 categories.

4. Electronic Data Carrier in B&H PHC

It is obvious that actual concept of medical documentation in B&H PHC does not fulfil all expectations, specially not for fast, efficient and quality decision making in the health system. Larger piece of this segment should be reduced and adopted to automatic data processing. Additional question is, what kind of patient data carrier should be used: bar-code card, magnetic stripe card, chip card, smart card or laser card.

5. **Medical Card Types in Term of Use**

5.1. Professional Card

Professional card are for medical and other staff. Beside general data about service provider, or data about administrative staff in health system, there is data of access level to administrative cards and medical records.

5.2. Administrative Card

On this kind of card you can find general data and in most of the cases, data necessary for emergency.

5.3. Medical Card of a Patient

This kind of card takes over all data placed at an administrative card. Data placed at an administrative card could be easily placed at laser and chip card as well. But, larger amount of information could be placed just at a laser card, particularly CT and MRI examination. Copies of a laser card content should be place at a PHC doctor. One of the possible ways for transfer of data is through telecommunication system which expensive and not reliable, and another way is to patient all his data carries with his own. Doctor consultant would have all required data in his computer using electronic medical record, and access to the data would be enabled by his code located in his professional card.

So far, the following cards have been used: Bar-code card, Magnetic stripe card, Smart Card, Laser Card and hybrid card which integrate good and bad characteristics of last two.

6. **Medical Card Types in Term of Type of Media for Data Carrier**

6.1. Laser Card

In last ten years, Drexel Technology Corporations has been developing new staff capable for storage of CT, MRI or X-ray examinations.. Laser card is small memory card capable to accept 2000 sheets of information or about 80 images. Capacity of the card is 4–16 MB.

Graphics, voice, identification biometric data as finger prints can be stored at laser card. The card is same size of credit card, and can be used on the same way as floppy disk, and carried in a valet as any other credit card. Using laser card costs can be dramatically reduced. Also, duplicating medical examinations and findings, repeated vaccinations, unnecessary medication prescription could be avoided. If injured patient has laser card with medical record, they can easily access all data related to saving life of the person. Those data could be allergies on medications, blood group, etc.

6.2. Smart Card

Smart card is plastic card with special, and it is used as medium for transport of information and communication between men and machine. A typical Smart card solution consists of six elements. The Chip card or Smart card itself, where a Chip card is "just" memory card, which can store information. A "true" Smart card contains in addition at least one Microprocessor, which powers and controls the functions to be performed. Acceptance devices - These are typically read and/or read/write devices, which interact with the card through either physical contacts or from some distance with laser beams or radio frequencies. Workstations – Personal computers or workstations, which can be attached to the acceptance devices. These could also be other devices like information terminals or Automated Teller machines. Networks – through which the Smart card initiated transactions, are transported for processing. Computing centres for processing the transactions and services.

6.3. Hybrid Card

This technology is based on Chip and laser card technology. Using both technologies we have data control safety and large capacity provided by laser card technology. Also, we can modify data at the hybrid card. Since that we have combination of two, capacity is bit smaller.

7. Conclusion and Recommendations

In Bosnia and Herzegovina is in process health system reform and expert team has been working on reduction of "paper" documentations and computerisation through family medicine program conducted by the Federal Ministry of Health. Also, in Bosnia and Herzegovina there are implementing several pilot project independently developed and mostly supported by International organizations and foreign Universities. Those projects are based on foreign health systems and as such not adjusted to Bosnia and Herzegovina's needs and requirements. In Bosnia and Herzegovina we have experience, where 15 years ago, Prof. Masic and his team developed a number of data carriers to be used in PHC. We strongly recommend that data entry to be based on Family Record/Family Registration Card.

Hardware and software should enable integration of independently developed (none standardized) systems in PHC. Organization, design and implementation of "Patient Card System" should be in accordance with relevant international and European standards, and in Bosnia and Herzegovina will be directly in correlation with available funds.

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