Integrated medical information system in Romanian GP activities
- a study case

LILIANA ROGOZEA
FLORIN LEAŞU
CODRUTA NEMET
Transilvania University of Brasov
ROMANIA
florinleasu@yahoo.com

Abstract: Using bioinformatics in GP practice not only ensure data collection to be sent to health authorities, but an optimization of medical activity in general practitioner's office. Throughout the world there have been developed different software products, but the main criterion for which they are chosen by the user is accessibility. The development of friendly e-tools can be made based on an analysis done by those who use these products, and the analysis made by them is an important tool for their improvement.

Key Words: e-tools, medical software, general practitioner

1. Introduction
Future challenges for management can be placed within the health system capacity to respond to changes in society, including the individual medical offices. Whatever the scenario developed to increase system capacity to respond to new challenges that arise in daily work, the challenge will be to identify tools that are available and to allow targeting of limited resources, to focus the energy to those elements that can improve health service delivery. [1, 3]
To answer these challenges, developing a medical information system will facilitate not only to increase the quality of medical services but communication existing within these entities: communication with patients, intra-organizational communication and communication with health authorities.

2. General considerations on the organization and operation of medical offices
Human health care, preventive, curative, rehabilitation and emergency which is done through medical offices, as providing such services, can be improved by the development of modern information systems, to meet not only the role of accounting the activities in the medical service but to improve the management of specific activities rendered.

The information system has to provide as much solving real needs of people entered the medical office lists and increasing addressability of the medical staff.
In the current era of medical service provision is no longer sufficient; expectations of patients in the doctor-patient communication or to reduce the risk of congestion by providing ad-hoc cabinet can and should be replaced with the programming computer system and information on education health of the patient may be supplemented by information available on each family physician's website or through connection to specialized sites with valid information. [4, 11]
Information system for medical staff can provide organization and archiving of patient records and other necessary documents. The use of information system improves the efficiency of activities, proper supervision of patients, a rapid and dynamic appreciation of their health and potential biological and medical background, and can reduce the risks of the certain treatments.
Connecting to a national network of medical offices not only provide interconnection of secondary and primary care, but also an important source of information for medical and surgical emergency or for national assessment of the health of the population in an area. [9]
Another phase of system development should be linked with dentists' integration to this system.
The main services provided to patients in private practices are presented in the following scheme:
3. Bio-information system

The main types of applications in healthcare information systems are presented in the following scheme:

In the case of ambulatory patients, the main functions of this system are: defining and selecting eligible persons, scheduling visits, registration of performed procedures, completing medical records or monitoring patient progress. In the system should be introduced both medical documents static (register card) and those circulating.

The information system must be useful and usable also for carrying out medical cabinet scoreboard that of structuring information in a set of information selected, organized and presented as indicators to assess and monitor the activities of the medical office and their presentation in a useful and easily readable graphic form. The most common difficulties and problems arising from implementation of a dashboard of general medical practice are connected with: improper storage of data, inadequate data collection due to insufficient training or superficiality in their collection.

Creating a coherent data stream is a prerequisite to improve office functionality both with the patient (the connection between individual and aggregate data) and with the health system.

Software products must be easily integrated in the family medicine cabinet to ensure a quick and easy editing of medical documents and records, accessible to medical staff in the office, but ensuring the confidentiality of information. [11, 15]

The computerized system is an ideal and complex instrument which assures efficient management of business for healthcare providers.

4. Case Study

The medical system impact analysis was conducted using a business assessment of a family medical practice in which the work done for the 1450 patients was performed by an information system which does consultation programming, development and release of recipes, tickets references, sick leave, annual accounts and vaccinations programming.

Based on collected data we can elaborate reports on insured/uninsured patients and manage information in order to see the type of contractual relationship physician - patient, and visualization of the patient benefits: compensated medical orders, sick leave etc. We can also make an assessment of the patient data (sex, age, population ratio active / passive, etc.), and the knowledge of the disorders for the patients enrolled on GP.

Thus, the GP was able to calculate the number of patients with different diseases, and to compare data from their existing family office with other institutions. The results obtained with chronic pathology software assessment are presented in the following graph:

---

**Fig nr. 1 Type of services provided to patients in medical office**

Services to patients in medical office may be preventive or curative.

**Fig nr. 2 Type of preventive and curative services provided to patients in medical office**

**Fig nr. 3 Information system**
HTA = Hypertension, RAA = Rheumatic fever, BCI = Ischemic Coronary Heart Disease
BPOC = Chronic obstructive pulmonary disease
AVC = stroke

We note that predominate Hypertension - HTN (17%) and Ischemic Coronary Heart Disease – ICHD (16%). In Brasov County there is a prevalence of 10.1% for HTN and 6.7% for ICHD, which means a better diagnosis and reporting in the general practitioner's office.

Other assessments required in the medical office offered an insight into the pathology of patients in private practice and allowed the family physician to develop his own program of primary prevention, secondary or tertiary.

The software used also provided the comparison of information from different time periods.

We can compare the data from March 2006 (without electronic database) with March 2007 (with electronic database). In March 2006, in 23 working days there were 430 consultations with 310 medical orders. In Mach 2007, in 22 working days, there were 680 consultations with 354 medical orders. It is obvious that from one year to another, with the help of the electronic database the number of consultations rise with 63%, which is very important for the sick patient.

Moreover, due to the possibility of quick view of the previous month treatment, the number of prescriptions issued increased from 14/day to 16/day (16%).

We can compare the data from March 2006 (without electronic database) with March 2007 (with electronic database). In March 2006, in 23 working days there were 430 consultations with 310 medical orders. In Mach 2007, in 22 working days, there were 680 consultations with 354 medical orders. It is obvious that from one year to another, with the help of the electronic database the number of consultations rise with 63%, which is very important for the sick patient.
This prevents agglomeration in the waiting room, the number of patients per day being influenced by the number of patients with acute illness who present without programming!
The quality of consultation increased from month to month, the doctor may give the patient more time. Instead of searching patient records in the drawer, doctors can use their training better: ultrasound, electrocardiograms, family counselling, health education, maternal education in child care problems!

In this way the doctor can diagnose disease early and few more patients reach further advice! This is not only for the general practitioner, but for the specialist doctor who can consult only cases that are outside the competence of fellow doctors.
To make the final report in March 2006, the time was approximately 20 hours. With the electronic database the report may be made in 1 hour, the rest of the time can be used for other activities.

5. Conclusions:
Computerization of medical office has direct and indirect benefits by ascending pyramid steps, such as:
- reduction of waiting times at the cabinet;
- increased consultation time granted to the patient;
- increased patient's satisfaction;
- increased accuracy of data reported to health authorities;
- public health strategies closer to reality in outpatient medical practice;
- cost-effectiveness of health strategies of public authorities;
- improved image of the medical system (providers, health authorities).
Is also very important to analyze and develop all the software for GP in an ethical way and develop a modality to improve the activities of GP according with the national legislation [6, 7, 8, 13]
The soft could be also use for health research and for developing the health promotion programme based by the own necessity of GP practitioner. [5, 16, 17]
Also the student, future doctor must be educating in a proper way for being able to use such software in their GP activities. [2, 10, 12, 14]

References
[6] Normele metodologice de aplicare ale Contractului-cadru în asistența medicală primară
[10] Repanovici, A. Information technology implication in student behaviour for information literacy skills- Proceedings of the 4th


