

PROFISSIONAIS E ORGANIZAÇÕES DE SAÚDE E A FALTA DE SENSIBILIZAÇÃO PARA A UTILIZAÇÃO DE RECURSOS DE TECNOLOGIA DA INFORMAÇÃO NA FRENTE DE SUA MAIOR BENEFICIÁRIO: PACIENTES

RESUMO

A entrada da tecnologia da informação nas organizações de saúde tem vindo a provocar uma verdadeira revolução, com novas propostas, a fim de se tornar um novo facilitador prática diariamente de profissionais de saúde. Este artigo tem o objetivo de avaliar o Prontuário Eletrônico do Paciente (PEP) - ALERT EDIS - em Hospital Universitário. Foi avaliada uma amostra de 1.226 cartões médicos de pacientes que foram atendidos por 13 especialidades médicas diferentes. Em 95% dos cartões médicos, tem havido uma inserção de um fundo, e uma inserção de 100% de um diagnóstico, e em apenas 0,32% não houve informação causa anamnese nem externo (quando aplicável). Na 9,54% dos cartões médicos não houve evolução e em 31% os resultados dos exames pedidos não foram descritos. Considerando-se uma abordagem global, a EPR apresenta uma boa integridade da maioria dos itens avaliados (-10% de ausência). O EPR com realização campo obrigatório é muito valioso para a sua própria qualidade, com benefícios para a assistência ao paciente.

Palavras-chave: Tecnologia da Informação; Relação Humana; Serviços de Saúde; Prontuário Eletrônico do Paciente; Informação em Saúde.

HEALTH PROFESSIONALS AND ORGANIZATIONS LACK OF AWARENESS REGARDING THE INFORMATION TECHNOLOGY RESOURCES USAGE IN FRONT OF THEIR MAJOR BENEFICIARY: PATIENTS

ABSTRACT

The entrance of the information technology within health organizations has been causing a true revolution, with new proposals in order to become a new practical facilitator on daily basis of health professionals. This article has the objective to evaluate the Electronic Patient Record (EPR) – ALERT EDIS – at a University Hospital. It has been evaluated a sample of 1,226 medical-cards from patients that have been served by 13 different medical specialties. In 95% of the medical cards there has been an insertion of a responsible and a 100% insertion of a diagnostics, and in only 0.32% there has been no anamnesis nor external cause information (when applicable). In 9.54% of the medical cards there has been no evolution and in 31% the requested exams results were not described. Considering an overall, the EPR presents a good completeness from the majority of the evaluated items (-10% of absence). The EPR with compulsory field fulfillment is very valuable for its own quality with benefits to the patient assistance.

Keywords: Information Technology; Human Relationship; Health Services; Electronic Patient Record; Health Information.

Jayr Figueiredo de Oliveira¹

¹ Doutor em Educação pela Pontifícia Universidade Católica de São Paulo – PUC/SP. Pesquisador da Fundação Getúlio Vargas – FGV. Brasil. E-mail: jfigueiredo@usp.br

1 INTRODUCTION:

In a complex world constituted by multiple and diversified organizations, Information Technologies (IT) has become determinant towards a competitive positioning and conduction for practically any organization, transforming many times the business reality and its own essence. Many decades passed by, many positive and negative transformations have jolted the society in much have transformed that XIX century hospital. Hospitals are organizations integrated to the services economy that along with the advances of information society, utilize, even more intensely, the ITs on their work processes management and in the activities inherent to the provider and user relationship in the hospital production and service supply. Practical applications of IT have evolved, more precisely those computational to support patients in hospital environment not differing much from experiences in other fields. Thus with noticeable great expectations and ambitious projects which were seldom successfully concluded. Mitchell's (1969) survey pointed out at some of those expectations related to Electronic Patient Record (EPR), which had the objective to properly store and maneuver a continuously growing volume of patient record data, including an efficient mechanism for communication between the numerous professional participants who were generating and using it. Other researchers performing upon this field, Bennett and Holland (1965), emphasized that simply adopting computers may still not be considered a solution for the problem of record maintainability, further facing this as a naïve point of view since there still remains an enormous amount of difficulties to be overcome.

The above authors' comments become relevant since it is a clear illustration of the continuous discussion surrounding conflicting ideas on the health technology field where; on one hand stands those who believe that computer use for recording data is a solution for all problems, and on the other, we have those who defend that the adoption of new technologies worsens existing problems meanwhile it introduces new problems. For those who think that this is a recent debate, we can enhance that; Mitchell's (1969), Bennett's and Holland's (1965) works date from the early 60's.

The essence of these authors' questioning remains contemporary even after more than half a century, as it may be observed through current discussions on EPR implementation. Progress was evidently achieved and along with it some issues found at that time had been worked around with the current technology – as well as new worries continue emerging.

In order for EPR to attain its full potential, it is necessary that the existing problems may be comprehended and analyzed, such as: Which are the

current limits of EPR? Which problems already have solutions and which perspectives to overcome were frustrated? Where stands the importance of the EPR in the communication progress between the health staff and patient? Which is the importance of this tool for the hospital-based services and health care clinics? Some of the above discussions are addressed as follows.

2 THEORETICAL INPUT

2.1 The Hospitals and Their Constant Change Needs:

Born through a medieval model of the Christian charity expression, the hospital as we know it today; has followed various social courses throughout time. Going through the *Ancien Regime* – originally based on the aristocratic social and political system established in France under the Valois and Bourbon dynasties lasting across the 16th and 18th centuries – molding it as a “totalitarian institution and as an instrument for social control” (Barbosa e Lisboa, 2009) reaching thus the first part of this century, where Organizations and Management devour the humanitarian spirit transforming “The House of the Dead” into an enterprise institution composed with all the vectors that a good business administration requires. No choice was left, either it underwent transformation or was consumed by the speed of new age (BARBOSA E LISBOA, 2006). In fact, it is important to enlighten that the hospital institution did not transform itself, other it was transformed. As Barbosa e Lisboa (2006) states, it was not an endogenous process, but better, a slow revolution from the outside to inside, thus an always difficult mutation to be equated by the new “feudal lords”.

Due to its health care background, its aseptic procedures, and natural convergence of health care professionals, hospitals started to be recognized by the community as the only place where efficiency and complete medical treatments were offered (OLIVEIRA, 2009).

According to Romero e Cunha (2006), throughout the last three decades hospital-health care operations have been going through a “beheading” of its genuine functions, thus adapting itself to the new reality. Which according to Oliveira's (2009) point of view; would not be necessarily something negative. But when we look at the private hospital networks throughout the greatest nations in the world facing their future, we encounter new challenges.

As Porter and Teisberg (2007) have exposed, during various years the hospital care segment has gone through mutations with the introduction of “substitutes”. In other words, companies, institutions or entities formed to occupy the gap left by hospital

inefficiency. At first, the function areas for Diagnosis and home health care were removed and immediately substituted by Home Care companies. During these last five years, this fact did not differ much for the low complexity surgical sector, which had been demonstrating itself as an important source of income revenue but it started to work as Day Hospital (HUMMEL, 2006).

On the authority of Oliveira (2009), the question remains where and which will be the next sector or activity to be “beheaded”. According to Paes (2011), the answer is being configured and becoming clearer for the developed countries: for primary care. Throughout one decade, around 70% of all primary care, will have as desired goal the outpatient procedure, whether it is in specialized clinic programs, Basic Health care Services, Emergency Medical Services, medical offices or even targeted towards “Home Care”, care at the patient’s own house.

Oliveira and Gonçalves (2009) reported that in August 2005, the largest hospital of Latin America, “Hospital das Clínicas” (HC) from São Paulo city, Brazil, initiated a transfer process of all their low complexity health services to 13 outpatient care units of the State and 14 São Paulo Counties. The HC hospital was delivering 1.5 million urgent care services per year. Simple medical cases without the need of a specialist are nowadays treated at the Basic Health care Units and the high complexity cases are delivered to specialty care ambulatories of the State or to the HC Central Institute. This is an indication that this prestigious entity has clearly noticed new paths to be taken on the Primary Care theme. Many similar samples of this procedure have been followed all over Brazil and the world.

However, Paes (2011) questions about the willingness of hospitals for change. Some say that they do want to innovate but don’t know how, others are not willing to thus continue decadent. The great majority is lost and looking for some kind of alternative that will fit their management guidelines. Furthermore, to the social transformations occurring in this new century we sum up the huge impact that IT is causing on Medical Science and Health Administration.

According to Valle (2010), meanwhile we are reading a five minute text 1800 new users are connecting themselves to the Internet. In 1991 these users did not even reach five million, though nowadays it has already exceeded 1.5 billion, while in Brazil the number has already reached 26 million. The Digital Economy Fact Book (LEONARDE E. DANIEL, 2006) has revealed a projection of half billion Broadband users in 2010. The current number of web access for Brazil is of 83.4 million (BARBOSA, 2012). Oliveira (2009) considers that the web is causing an unavoidable and unstoppable modification.

While Falk (2008) investigates through the core of the change: the great majority of hospitals, especially in Brazil, work in “services line” model, or in other words, have developed along the years organizational structures centered in services lines.. It was obvious that people and mainly doctors would comfortably become adapted to this logic model. But changes overcame the world, Medicine, and people. Health Care Systems bankrupted and technologies now occupy an extent area never imagined before while the final consumer is going through a forthright transformation (PATRICK, 2009). Though Kluk *et. al.* (2011) alleges that there are few options available for hospitals to remodel their organization, considering that the current focus is the patient - the patient centered. It is the patient who is demanding this change. The new hospital reorganization would have as a goal the creation of institutions “without walls”, where the physical location is unimportant and the real matter is to reach the patient wherever he/she may be.

In the last two or three decades, ITs have promoted and helped business process integration. Oliveira (2012) points out that even with the uncertainties that many of the hospital administrators have ahead of a socioeconomic-cultural change process, the hospitals have fixed to a Scale Model , combining and managing a specific set of “operational blocks” – drugstore, laboratories, Intensive Care Units (ICU), emergency, ambulatory care and surgery center – in general totally disintegrated.

Oliveira and Gonçalves (2009) also believed that hospital organizations have been passively accepting doctors’ imperial position to avoid digitalization of clinic protocols or any other medical record, since utilizing computers as a tool to “unclog the arteries of inefficiency” was and still remains an heretic solution for that fortified medical community (OLIVEIRA, 2009). Each professional works with his situational experience and within his professional context. In many cases, these physicians with habits acquired from their academic degree use their own chosen equipment and input, and some even impose their own payment model resources. There are of course some commendable exceptions and alluding to technological matters the majority of hospitals still continue using it exclusively for the Intensive Care Units (ICU) (Kluk *et. al* 2011). Glancing at the Brazilian Public Health Care System we can notice a much complicated process, since the sector has always used scrapping of: facilities, services, equipment and...doctors.

2.2 Motivational automation of health care units in Brazil

Registering patient condition has been a long term recommendation, thus assembling data on physical condition and disease to medical records;

grouping all necessary information on patients, has been a daily task for all those who work in the health care field, mainly institutions like hospitals and clinics. Paper forms have been used since times of Hippocrates (Cent. 5 B.C) progressing through various secular transformations until the present systemized form (GALVÃO E RICARTE, 2012). Therefore, health care units have acquired experience in the task of keeping these medical records and though divergence among proposals do happen, health care units in Brazil and around the world keep a file management structure for medical records which supports health care and research. Many institutions use technology as a management support tool for: indexation, localization and tracking of medical care activities.

According to Galvão and Ricarte (2012) the issues that must be considered are: Why shall we computerize patient medical record? Which is the motivation for making direct or indirect impacting decisions on health care professionals and population? Favorable argumentations towards automation are generally related to quality and efficiency upgrade of provided services. Some of these arguments will be detailed bellow.

According to Hummel (2008) one of the main arguments favorable to patient medical records automation is related to the amount of information in need to be stored – which by the way, is a priority argument. With the expansion of attention given to health care, the enormous diversity of professionals involved and legal demands to maintain and preserve these medical records, has paced up to such dimension that the volume of paper to be stored has become of difficult maintainability. Because of legal requirements which establish a preservation period and custody assignment of these record files to health care institutes, it has become necessary to keep a large-sized filing structure.

Hummel (2006) considers that even a HD (Hard Disk) in a small computer has the capacity to store about hundreds of millions of text pages; this would be the electronic version of a health care file arrangement potentially occupying less space than the equivalent paper file. Even taking in consideration that demands for safe data storage requires coexisting security data copies, the possibility for information storage in a digital environment is most attractive for sure.

A further argument for automation pertains to health care professionals' convenience while accessing patient's information whenever necessary – as for instance; while giving immediate patient care. Taking in consideration current technologies, such commodities can be concretized in two basic manners.

The first fast and efficient access mode to the patient's records data is done through network connected computers utilization (OLIVEIRA, 2009).

While the health professional attends his/hers patient in a basic health care unit he/she is able to have direct access to records through a central service with medical record data, thus he/she might as well consult previous kept records, as well as add new information data, automatically incorporated to files available for consultation to other professionals.

Second: utilizing the possibility of taking patient data record versions to health care units that do not have access to Internet computing, through portable devices as; notebooks, portable digital assistants or even mobile phones. The updated information obtained by professionals after patient's health care can afterwards be retransferred back to the health care system unit performing this way a synchronized process with data from the host computer record, thus always observing the existing legal aspects in each country (HUMMEL, 2006).

Whichever procedure the professional used to access information, the possibility of data interchange remains as an important characteristic associated to the adoption of these electronic devices. Medical record transit between two health care spots is a real logistic problem that may easily be solved through electronic systems. According to Kluk *et. al.* (2011) it is not necessary for a professional to end updating or consulting patient's medical record in order for another medical colleague to have access to it while attending the same patient. The matter on simultaneous (or competitive) access to electronic data is a classic theme for the database and distribution systems area with broadly known solutions. So as for instance, accessing for means of health care and management may happen simultaneously without damages to the parts involved.

Souza (2009) points out at another strong argument favorable to records automation and legible handwriting for notes related to medical records, as a mean of communication among professionals. Situations where notes or prescriptions are illegible to others and even in some extreme cases to the professional himself are of common knowledge (REGO *et. al.*, 2009; POISSANT *et. al.*, 2005). A simple solution for this problem may be realized through typing notes or prescriptions on a computer which is additionally abled to correct orthographic errors thus also diminishing potential typos.

Expected benefits resulting from EPR implementation may grow further, but we shall not forget to mention one aspect: the prospect of integrating it to other health care Information Systems (IS), since the interoperability - which has a relation with separate components capacity of working through cooperation inside or in between institutions by means of exchanging data messages – consequently upgrading caring process and reducing expenditures for the health care system. EPR may also be directly fed by an information supply system chain, like the

availability of laboratory exam results and through handling with patient estimate devices at health care centers. As stated by Handel e Hackman (2010), the patient medical record is a source of information and data for other systems (financial, aid agency, management, and research) in the health care unit environment, which in turn feeds the governmental HIS, thus always being able to count on improved, updated and trustful information.

Therefore, development motivations are plentiful for means of adopting EPR. Even so, some professionals and institutions have been showing opposition.

2.3 Resistance to patient medical records automation

Those who only look at the potential benefits that automated EPR can produce to health care professionals, patients and managers may be tempted to adopt this system in an unconditional manner. Such positioning has commonly faced strong opposition, making this point of view something interesting to be analyzed.

The first argument encloses a historical background. Various attempts have been done since the 60's viewing to install this feature. Thus, if solutions for automation could be as simple as some unconditional defenders have placed it, EPR would certainly be a quotidian procedure like for bank computer systems utilization (HUMMEL, 2008).

Kweku (2003) has analyzed within the specialized literature on this field that a great amount of software projects have been encased without even reaching proposed objectives and this is generally because a lack of accuracy on system needs assessment. Nowadays systems – denominated as modern – provided by EPR, multi professionals and inter-institutional are outlined by a high level of complexity for interactions involved in production, organization, and data-information employment. Ignoring such complexity could lead to solution developments that do not provide the most important requisites for this system; like performance and hardware upgrading. This performance is related with time (how long does it take for information to be available – how long does it take for a task to be ended). Meanwhile, hardware upgrading is tied up to system volume or specifically speaking, on how to optimize performance with user increase and amount of data-information stored in the system (KWEKU, 2003).

As reported by Hummel (2008), this potential complexity derived from a good EPR implementation, leads us to another argument against its computerization which is connected to expenditures. The administration of great health care units is faced with high wages for Computer System

Implementation and IS maintenance, also the necessity for a web net for this information to efficiently arrive at the required spots. However, traditional system maintenance costs for medical records may result high; administrators, or if you would rather, managers should consider that both structures should be kept, being that it would almost be impossible to make a complete instant migration from paper to electronic support. Thus, it is a normal behavior for those managers to have doubts on the necessary time for expense reductions and benefits to further show yields of their investment.

Oliveira (2012) points out; that those professionals on the other side are confronted with lack of information and doubts on the system to be implemented. Also, one of the usual concerns is that they would probably be left aside when selecting a automation system, thus the choice and approval would be imposed by the administrators.

For each one of the above stated arguments favorable to ERP adoption – stock volume reduction, simultaneous accessibility and sharing possibilities, annotation readability, and system integration convenience – are some co-argumentations that need to be considered and known.

On the subject related to stock volume reduction, Oliveira (2003) acknowledges that previous experiences in other areas have shown that these advantages are relative. Discarding paper from the workplace environs was also the main purpose for computerizing business offices since the early 70's. However, it was shown through practice that with computer and printers' dissemination in these working ambient, the final result became the other way round – documents printed for fast revisions and reading being discarded right away then printed again when necessary, thus resulting on a meaningful paper expenditure (OLIVEIRA, 2003).

Filing records in a digital format originates further necessities related to its preservation; like durability and availability of the stocked information.

Access facility to data and information remains as a broad additional attribute to be questioned. According to Irani *et. al.* (2009) it is more comfortable for most professionals while working on patient health care, to have a paper version of the medical folder available and already checked out by other professionals for them. This preference does not take in consideration the effort and time expended by this rearguard staff, other than obtaining the same information through a computer terminal. Greenhalgh *et. al.* (2009) observes that it is most comfortable reading paper form records thus dismissing electronic terminal interaction with interfaces, screens and messages, which may sometimes be unclear including that it is much easier to add written comments on a paper than having to open a screen and type those same comments. This access ability to data and information

is viewed as greater benefit for hospital organizations, which need to keep such structure in order to hand over information to health care professionals; who in turn do not profit much from it.

Though typing makes EPR annotations clearer, we still have to admit that not all problems inherent are automatically solved with automatization. Inasmuch digital typing is clear and readable, using nonstandard terms and codes on unstructured fields freely typed by professionals, may still transform texts into an incomprehensible jargon.

On the authority of Van der Linden *et. al.* (2009), record sharing is undoubtedly a benefit, though it still implies a risk to EPR since larger availability of data, has originated doubts confronting information safety. Thus according to surveys made over health care professional's resistance to adopt EPR, the greatest obstacle to be overcome is the aforementioned reason. Beyond these worries remains ethical concerns on the possibility of misuse of these IS collected patient information by outsiders.

2.4 EPR and health professionals' perception on its benefits

As the above-mentioned, there are countless protective actions and technical solutions for data security and EPR information question. According to Kluk *et. al.* (2011) ethics and patient privacy are issues that may be dealt properly among service providers and institutions that have opted to adopt EPR.

As stated by Galvão e Ricarte (2012), many doubts were set forth by health professionals related to the benefits that these automatized systems may offer for performing their activities. Considering the existing complexity of these systems together with those organizations who adopt them, it is not awesome to be aware that there are accounts on both failing and successful implementations.

On a general grasp, what we may observe in these studies on efficient implementation of EPR is an enormous variation of recognition over the benefit achievements within the numerous fields supplied by it. A research over various studies indicates that automatized systems in a small scale, have a tendency to be more efficient than those in larger health care units (GREENHALGH *et. al.*, 2009), thus suggesting that the question on hardware upgrading needs to be further analyzed during the EPR implementation.

Meanwhile a number of studies shows that EPR adoption for basic health care has had a relative success (IRANI *et. al.*, 2009; LUDWICK and DOUCETTE, 2009), while some other studies report problems with office time increase on medical care due to automatized systems introduction (POISSANT *et. al.*, 2005). Urgent Care Centers are mainly sensitive to performance problems (HANDEL E HACKMAN, 2010; PATRICK, 2009).

Some of these problems are directly linked to the lack of appropriate training to EPR use, as it may be observed on a study on professionals' satisfaction with these automatized systems indicating that there is a tendency for this to increase with time (EL-KAREH *et. al.*, 2009). In other words, part of this dissatisfaction initially manifested by professionals is related to the lack of knowledge on the function and correct usage of EPR. Institution administrators and managers who adopt the EPR should be aware of the changes that automatized systems bring along to professionals, thus offering beginner's training and continuous empowering programs aiming and effective use.

Though it is advisable to recognize that in some other situations, the reason for problems stands in the lack of adequacy of the EPR developed to conform health care institutions or professionals. It is common to attempt generalizing the same solutions for all situations or providing all professionals regardless of their spatiality. A negative experience was pointed throughout one survey where the computerized system developed was not completely adapted to the unique context and practicing of the urgent care sector of a large metropolitan hospital in the central region of São Paulo – Brazil (OLIVEIRA, 2012).

However, we may observe another aspect rooted to these problems and to which would be necessary an evolution on the computerized systems and legislation. Having this in mind, the following fieldwork was made with the goal to evaluate, after 12 months of system ALERT EDIS v2.6 implementation, and identify the absent items to be filled in force by doctors, a procedure considered a mandatory by the Brazilian CFM (Brazilian Regional Council of Medicine) for patient medical records at Emergency Departments in an University Hospital linked to a Public University hosted in São Paulo city – Brazil, which records were filled in by the ALERT EDIS v2.6. Writing correct and detailed information on these records may be justified precisely because the ERP and its data belongs to the patient and thus should be permanently available to him with all kinds of correct and complete notes. So when requested by the patient or his legal representative, an authentic copy of it should be available with all the pertinent information.

The Medical Record Revision Commission functions with the objective of keeping these documents throughout a liable form of detecting inconsistencies and also apt for correcting errors as may be required. This research mainly aims medical record revisions and data availability to supply the Medical Record Revision Commission in order to engender actions for improvement towards information storage in medical records for the Emergency Department at the University Hospital (ED-UH).

3 METHODOLOGY

Filled out record forms were analyzed at a determined ALERT EDIS v2.6. computerized system, the convenient samples were printed and sent to the Hospital Information System and codified at the PS-UH nosology system (screening done with pre-medical care symptoms and disease classification). A total of 1226 medical records available in this System were selected by attendance dates booked within the 30 days of October.

The following survey was done for each selected record form: medical record number, name of clinic which filled it out, name and specialty of the doctor in charge who filled it out and his number at the Brazilian Regional Council of Medicine (CRM-SP), anamneses – patient’s record, evolution, requested exams; case there are related exam results, patient

discharge procedure, if medical care was motivated by an external cause; then in this case, a medical history compatible with topographic diagnosis and medical consultation date. Patient’s complaint, historical information, physical exams, and previous elapsed data of current interest are considered “anamneses”. Any information on recovery, worsening and death or patient’s medical state, where considered as evolution. External injury causes as intoxication and adverse effects make part of a classification axis from the International Classification of Diseases (ICD) since its ninth revision (OMS, 2004) which refers to violence, aggressions and accidents suffered by patients.

Data was collected to an Excel Worksheet and items evaluated one by one into a chart format.

4 RESULTS

Results will be presented according to researched items viewing a better appreciation.

Specialty health care

Table 1 – Health care number per specialty according to researched sample

SPECIALTY	HEALTH CARE NUMBER	PERCENTAGE (%)
General Surgery	161	13.13
Plastic Surgery	5	0.41
Thoracic Surgery	3	0.24
Vascular Surgery	11	0.90
Internal Medicine	218	17.78
Gynecology / Obstetrics	316	25.77
Neurosurgery	1	0.08
Ophthalmology	6	0.49
Otolaryngology	11	0.90
Pediatrics	338	27.41
Psychiatry	28	2.28
Traumatology	119	9.71
Urology	9	0.73
TOTAL	1,226*	100

*Medical care patients like those only attending screening examination or those that evaded from ED-UH without waiting for conclusion of medical case were not computed in this research.

4.1 Annotations of name and CRM (Brazilian National Council of Medicine) of the Doctor in charge

It is impossible to add data into an ALERT EDI v2.6. medical record, without first adding the name and password of the person who is providing patient medical care. Thus, 100% of the medical records were done with the presence of a person in

charge of filling out, whether he may be a resident, physician or professional on duty. Also an absence of notes was observed in 39 cases (3.18%) as to who was the resident doctor or the on duty chief that discussed the case with the academic taking care of the patient.

Anamneses

Only four medical records (0.32%) had no notes on main complaints, or even a succinct historical and/or physical exam.

Evolution

The following results have been observed on the subject of non-compliance “absence of evolution”.

As for evolution we have considered any notes on: patient worsening or recovering and if patient was discharged, hospitalized or dead.

Table 2 – Medical record numbers that did not show evolution in the researched sample

SPECIALTY	MEDICAL RECORD NUMBER	PERCENTAGE%
General Surgery	7	4.35
Plastic Surgery	0	0
Thoracic Surgery	0	0
Vascular Surgery	0	0
Internal Medicine	41	18.81
Gynecology / Obstetrics	5	1.58
Neurosurgery	0	0
Ophthalmology	0	0
Otolaryngology	3	27.27
Pediatrics	30	8.87
Psychiatry	8	28.57
Traumatology	21	17.65
Urology	2	22.22
TOTAL	117	9.54

Exams

Among 1226 medical records, 445 showed that patients had been requested for exams, but 135 (30.34%) of these exams were not evaluated and case they were they still do not appear as descriptive result on the medical records.

Topographic Diagnosis

An evaluation was made case a suitable topographic diagnosis was presented, in other words, it was verified if the final diagnosis contemplates the anatomic area of the evaluated disease.

The following results were obtained:

Table 3 – Medical record numbers that did not contain topographic diagnosis according to clinic historical of the surveyed samples.

SPECIALTY	MEDICAL RECORD NUMBER	PERCENTAGE%
General Surgery	41	25.46
Plastic Surgery	0	0
Thoracic Surgery	0	0
Vascular Surgery	2	18.18
Internal Medicine	13	5.96
Gynecology / Obstetrics	38	12.02
Neurosurgery	0	0
Ophthalmology	1	16.67
Otolaryngology	1	9.09
Pediatrics	11	3.25
Psychiatry	2	7.14
Traumatology	9	7.56
Urology	4	44.44
TOTAL	122	9.85

Compatible diagnosis

Diagnosis was considered compatible when in accordance with the clinic historical.

The following results were obtained:

Table 4 – Medical Record numbers which diagnoses were not compatible with the clinic historical of examined sample.

SPECIALTY	MEDICAL RECORD NUMBER	PERCENTAGE%
General Surgery	22	13.66
Plastic Surgery	0	0
Thoracic Surgery	0	0
Vascular Surgery	2	18.18
Internal Medicine	14	6.42
Gynecology / Obstetrics	133	42.09
Neurosurgery	0	0
Ophthalmology	3	50
Otolaryngology	1	9.09
Pedriatics	23	6.80
Psychiatry	2	7.14
Traumatology	15	12.6
Urology	43	33.33
TOTAL	258	21.04

Those diagnosis which did not contain patient’s complaints were considered not compatible, regardless the Clinic where the patient received his health care. “Polytrauma” diagnosis at the General Surgery Clinic was considered not compatible in cases where the patient presented a sole lesion or even injuries that were not leveled as a “Violent Trauma”. At the Gynecology/Obstetrics Clinic the diagnosis for “Supervision of the Normal Pregnancy” was considered incompatible with patients presenting “Urinary Infection”, “Vaginal Bleeding” at any stage of the pregnancy, “SAH” as well as any other diagnosis liable for classification by the ICD-10 (WHO, 2004).

External Causes

Information on external causes is not provided at the diagnosis item in almost all medical records, though it is possible to verify the matter in the record content if health care was derived or not from this type of complication. It was Only 4 medical records (0.32%) did not certify which was the external cause that motivated health care. Namely this information was not present in the file card, neither in the diagnosis, nor in the medical record text.

5 DISCUSSION

WHO anticipates basic items for Hospital Accreditation (Ministry of Health, 2010) for Medical

Records in an institution: it is requested at Level 1; dating medical record pages, patient identification, doctor’s signature and also the investigated items of the current work, anamneses, physical exam, evolution, an abstract and/or patient discharge diagnosis; at level 2 it is requested a Commission for Medical Record Revision; at level 3 it is requested a protocol for filling in the medical records elaborated by the above mentioned Commission and a research on user’s satisfaction of the medical-hospital registry.

Thus, the quality of medical records is a fundamental item in order to give accreditation to a hospital. A medical record completeness must be regularly evaluated by the Commission for Medical Record Revision, thus undergoing correction of misapplications. Romero & Cunha (2006) estimated the variable qualities of Mortality Medical Information System (MMIS), among them completeness measured by a proportion of ignored information fulfilling a determined variant. Creating the following evaluation degree score: excellent (less than 5%), good (5%-10%), regular (11%-20%), bad (21%-50%) and very bad (over 50%).

Being it a simple and direct form of evaluation, we will use these criteria to evaluate medical record completeness, thus evaluating the percentage of the contemplated items present in medical records; such items are considered an obligation by the Brazilian Regional Council of Medicine.

The final result of this research showed a great number of Pediatrics health care (27.57%) and Gynecology/Obstetrics (25.77 %). The item “Doctor

in charge” and “CFM”, demonstrated an excellent completeness with CFM registered doctors showing an absence percentage lower than 5%, a fact considered a severe infringement since the absence of a professional in charge of health care is unethical (CFM, 2002), even if this medical record has been filled in by a resident doctor or a chief medical officer.

Even though results showed only 4 files without the item “anamneses” (0.32% of the medical records, excellent completeness) in many instances this anamneses was summarized to the main complaint. The suitability of filling out this item was not evaluated in the hereby research, in other words, whether the anamneses is according as estimated in the manuals or not, since this is not the aim of this research.

A 9.54% lack on item evolution in medical records, points out at physicians’ lack of interest to inform whether health care was efficient or not, instead giving major importance in registering patient complaint and resulting medical care, thus leaving notes on reevaluation for this last item on the backburner. Excessive demand as declared by many doctors working for public health is not an excusable reason, as for instance the case with Internal Medicine where the absence of evolution occurred at almost 20% of the cases (regular completeness), being that this clinic is scored in third place on the health care volume subject (17.678% of all health care samples) after Pediatrics and Gynecology/Obstetrics. Furthermore, ED-UH considered as a reference for Tertiary Care treatments and the complexity of problems surrounding the typical patient of this specialty; the elderly that with multiple diseases and even severe cases to be investigated. This condition should stimulate physicians to be more careful while making annotations on the evolution of these patients. Nevertheless, completeness referring to this item may be regarded as good when considering the sample as a whole. At the Orthopedic Trauma Clinic the absence of this item was great (17.65% of the cases, regular completeness) which may be due to the specialty characteristic of this Hospital. Considering that the Emergency Department counts on a resident doctor responsible for all the hospitalized cases prescribed and health care of this sector, which also counts with two medical supervisors on duty who usually have to be absent from the Emergency Department in order to operate in urgent care cases, thus leaving the resident doctor overloaded. Despite this characteristic of the System, it is important to enhance that this information of this item on the medical record is compulsory according to CFM which also recommends that poor working conditions should be reported.

Medical record completeness at places like in some of the evaluated Hospitals in São Paulo (BORBA E LISBOA, 2009) varies from 72% to 86%, even though perinatal health care data has been evaluated in

this research rather than the medical record as a total. Through other information sources like the evaluation made by Souza (2009) in files from the Health Information Systems Programmed (HISP), the absence of items like medical exam results recording differs 7.5% for X-ray and 7.06% for histopathology in tuberculosis case.

For the medical specialties of Psychiatry, Otolaryngology, Urology, and Ophthalmology a consistent conclusion was not possible since the sample surveyed was too small.

Regarding to result remarks on requested exams; completeness was bad (68.90% completed) this probably derives from the availability of results right from the computer screen through HIS, which leads to doctors ignoring annotations for patient health care records.

One of the benefits that the ALERT EDIS v2.6. yields is the impossibility to close the case giving procedure to patient discharge without even informing the diagnosis. This fact contrasts with other places where surveys have shown us absence of diagnosis, illegible diagnosis or incoherent records with up to 12% of the surveyed medical records on health care patients, along the period of four years (LOTUFO E DUARTE, 1987). Highlighting that the stated study has surveyed medical records done on manually filled in paper versions and that the implementation of the information system at that setting was still on an incipient phase. In contrast, surveys done on medical records completeness for implementation of the electronic version (KLUK *et. al.*, 2011) shows us that the above stated is the greatest benefit extracted from this form of medical record together with the legibility factor.

Thus considering the item diagnosis presence in medical records evaluated at the ED-UH of excellent completeness. Conversely, a big number of patients (42.09%) that received health care at Gynecology/Obstetrics, had a generic diagnosis as “Normal Pregnancy Supervision” or “Pregnancy”, instead of contemplating a syndrome diagnosis or directed to patient’s complaints, similar to Lotufo and Duarte’s (1987) account. This way, the opportunity for a correct codification motivating patient’s visit is lost. Thus leading to future statistical difficulties through diagnosis research and financial loss for the ED-UH, as for instance, patients who were diagnosed with “High-Risk Pregnancy” or “Specific Hypertensive Disease of Pregnancy” have medical visits paid in a flexible different way, besides generating indicators that modify hospital classifications.

Through this survey presented to the Commission of Medical Record Revision actions have emerged aiming quality improvement for medical record information. The initial proposal action of the Commission was to send memorandums to doctors that registered medical records with irregularities to

the ALERT EDIS v2.6. Informing them on their knowledge of these irregularities, thus asking them to improve the way they fill them out and also to estimate the filled in records after every three months, so as to evaluate actions. It was also required from the doctors who entered diagnosis that were not totally compatible with the clinic history of the patient, to reevaluate them and case necessary to insert a new diagnosis contemplating the patient's complaint in an adequately manner. Informal meetings were done with the coordinator of the Department of Gynecology & Obstetrics aiming to offer orientation for doctors, residents, and students allocated in this department, about the need of inserting a precise diagnosis.

6 FINAL CONSIDERATIONS

As all IT systems, EPR is a document characterized on one hand by its uniqueness – it is unique for every patient, and on the other hand, by the plurality of authors producing texts and finally by the diversity of information registered in it. Thus also, a polyphonic document by its very nature, written by many type of authors – doctors, assistants, hospital nurses, social workers, psychologists, physiotherapists, nutritionists, speech therapists, pharmaceuticals, biochemists, among others. It is a systemic document composed with objective information – patient identification, prescriptions, health care etc., containing subjective information – disease symptoms decoding, patient complaints and exam interpretations.

In fact, the issue is a complex documentation tool produced by a health care team personnel working for a health care organization with the additional help of patients or their relatives. According to current standards, even if kept in electronically they will still need to be printed. These documents may have small or big data and information volume; however, it mostly depends on the disease and treatment necessary for the patient. Its organization-level permits to indicate a particular type of information for every structure, showing crossed-references and dependence relation between one topic and another. Drafting these documents using verbal and nonverbal signs, being some appropriately for a specific domain while others are more generic: in this document there are many abbreviations and acronyms. They have special characteristics, since they were not conceived for a continuous readout from beginning to end, instead the other way around according to users necessities. Therefore, consultation could be on a determined page or even on a paragraph containing specific information for resolution of a contingency action. Thus, consulting software documentation aims a particular demand for finding answers for specific questions to

certify whether a procedure or action should be or if it has already been done.

Although these documents may be produced for a precise situation and specific clientele, they may also be used by other people like patients and researchers from the health care field or other discipline alike. They are also a rich source of information as for surveys related to memory and certain other diseases treatment. Inasmuch, many pathologies have incipient incidence and information may still be insufficiently published by scientific magazines, being so, medical records may be the only reference source available

EPR is the quintessential media for information and communication among health care staffs as well as between the personnel and diseased person. This communication often happens without the presence of the subjects involved; whether they may be doctors, hospital nurses, technical and nursing personnel, pharmaceuticals, the patient himself, his/hers relatives or legal guardians.

Finally, it is understood that EPR is a technical document *suis generis* and that as any other it needs to be adequately treated, so that all contained information may be recovered in an efficient and thoroughgoing manner. Therefore, it is a type of automated systemic resource that must be further exploited within the IT context, as well as by the hospital managers and the health care clinic staff with awareness.

REFERENCES

- Barbosa, J. (2012). Acesso à internet no Brasil chega a 83,4 milhões de pessoas. *Jornal O Globo*, Caderno de Economia: digital e mídia, publicado em 29/08/12. Disponível em: <http://oglobo.globo.com/tecnologia/aceso-internet-no-brasil-chega-834-milhoes-de-pessoas-5932072>.
- Bennett, A. E.; Holland, W. W. (1965). Towards the development of electronic data-processing systems for medical records. *Lancet*, v.2, n.7423.
- Borba, V. R.; Lisboa, T. C. (2006). *Teoria geral de administração hospitalar: estrutura e evolução do processo de gestão hospitalar*. Rio de Janeiro: Qualitymark.
- _____, V. R.; LISBOA, T. C. (2009). Gestão estratégica em organizações de saúde. In: Borba, V. R.; Lisboa, T. C.; Ulhôa, W. M. M. *Gestão administrativa e financeira de organizações de saúde*. São Paulo: Atlas, p.39–74.

- Conselho Federal De Medicina (2002). *Resolução nº.1638/2002, de 10 de julho de 2002*. Define prontuário médico, responsabilidade médica e criação de Comissão de Revisão de Prontuário Médico. Disponível em: http://www.protaimedico.org.br/resolucoes/dfm/2002/1638_2002.htm.
- El-Kareh R.; Gandhi, T. K.; Poon, E. G.; Newmark, L. P.; Ungar, J.; Lipsitz, S.; Sequist, T. D. (2009). Trends in primary care clinician perceptions of a new electronic health record. *Journal of General International Medicine*, v.24, n.4, p.464-468.
- Falk, J. A. (2008). *Tecnologia da informação para a gestão de custos e resultado no hospital: considerações e dicas práticas para implantação de um modelo brasileiro*. São Paulo: Atlas.
- Galvão, M. C. B.; Ricarte, I. L. M. (2012). *Prontuário do paciente*. Rio de Janeiro: Guanabara Koogan.
- Greenhalgh, T.; Potts, H. W. W.; Wong, G.; Bark, P.; Swinglehurst, D. (2009). Tensions and paradoxes in electronic patient record research: a systematic literature review using the meta-narrative method. *The Milbank Quarterly*, v.8, n.4, p. 729-788.
- Handel, D. A.; Hackman, J. L. (2010). Implementing electronic health records in the emergency department. *Journal of Emergency Medicine*, v.38, n.2, p.257-263.
- Hummel, G. S. (2006). *eHealth - o iluminismo digital chega a saúde: as tecnologias de informação e comunicação revolucionando o setor da saúde*. São Paulo: STS.
- _____, G. S. (2008). *ePatient: a odisséia digital do paciente em busca da saúde*. São Paulo: STS.
- Irani, J. S.; Middleton, J. L.; Marfatia, R.; Omana, E. T.; D'Amico, F. (2009). The use of electronic health records in the exam room and patient satisfaction: a systematic review. *Journal of the American Board of Family Medicine*, v.22, n.5, p.553-562.
- Kluck, M. M.; Guimarães, J. R.; Caye, L.; Zirbes, S. F. (2011). *Registro eletrônico do atendimento ambulatorial: consolidando o prontuário eletrônico do paciente no Hospital de Clínicas de Porto Alegre*. Disponível em: <http://www.sbis.org.br/cbis/arquivos/713.rtf>.
- Kweku, E. M. (2003). *Software development failures*. MIT Press, Cambridge, MA, USA.
- Lenard, T. M.; Britton, D. B. (2006). *Digital Economy Fact Book*. 8th Edition, The Progress & Freedom Foundation.
- Lotufo, M.; Duarte, E. C. (1987). Avaliação dos serviços de saúde do Município de Cáceres, MT (Brasil): contribuições à programação local. *Revista de Saúde Pública*, v.21, n.5. São Paulo Outubro de 1987. Disponível em: <http://www.scielo.br/pdf/rsp/v21n5/08.pdf>.
- Ludwiick, D. A.; Doucette, J., (2009). Adopting electronic medical record in primary care: lessons learned from health information systems implementation experience in seven countries. *International Journal of Medical Informatics*, v.78, n.1, p.22-31.
- Ministério da Saúde (2010). *Política Nacional de Gestão de Tecnologias em Saúde*, Série B. Textos Básicos de Saúde, Brasília – DF, 2010. Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/construcao_politica_informacao_informatica_saude.pdf.
- Mitchell, J. H. (1969). Relevanced of the electronic computer to hospital medica records. *British Medical Journal* v.4, n.5676, p.157-159.
- Oliveira, J. F. (2003). *TIC – Tecnologias da Informação e da Comunicação*. São Paulo: Érica.
- _____, J. F. (2012). Technology and Unemployment for Executives in Hospitals. *Journal of Technology Management & Innovation*. v.7, Issue 3, p.110–120.
- _____, J. F., (2009). Gestão sistêmica hospitalar: uma abordagem contextual. In: Borba, V. R.; Lisboa, T. C.; Ulhôa, W. M. M. *Gestão administrativa e financeira de organizações de saúde*. São Paulo: Atlas, p.07–38.
- Oliveira, M. A. G.; Gonçalves, M. A. (2009). Sincronização de leitos hospitalares de um hospital de médio porte de acordo com os princípios da teoria das restrições. In: Borba, V. R.; Lisboa, T. C.; Ulhôa, W. M. M. *Gestão administrativa e financeira de organizações de saúde*. São Paulo: Atlas, p.113-131.
- OMS. (2004). *Mieux communiquer pour mieux soigner*. Disponível em: <http://www.sante.gouv.fr/hm/actu/telesante/telesante1.htm>.

- Paes, L. R. A. (2011). *Gestão de operações em saúde para hospitais, clínicas, consultórios e serviços de diagnóstico*. São Paulo: Atheneu.
- Patrick, J. (2009). *A critical essay on the deployment of ED clinical information system: systemic failure or bad Lucky?* University of Sydney, Sydney, Australia. Disponível em: <http://www.it.usyd.edu.au/cerca de hirtru/essays/>.
- Poissant, L.; Pereira, J.; Tamblyn, R.; Kawasumi, Y. (2005). The impact of electronic health records on time efficiency of physicians and nurses: a systematic review. *Journal of the American Medical Informatics Association*, v.12, n.5, p. 505-516.
- Porter, M.; Teisberg, E. O. (2007). *Repensando a saúde: estratégias para melhorar a qualidade e reduzir custos*. Porto Alegre: Bookman Companhia.
- Rego, M. A . S.; França, E. B.; Afonso, D. C. C. (2009). Avaliação da qualidade da informação do Sistema de Informação Perinatal (SIP-CLAP/OPAS) para monitoramento da assistência perinatal, Belo Horizonte, 2004. *Revista Brasileira de Saúde Mater. Infantil*, v.9, n.3. Recife. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttex&pid=S1519-38292009000300006.
- Romero, D. E.; Cunha. C. B. (2006). Avaliação da qualidade das variáveis sócio-econômicas e demográficas dos óbitos de crianças menores de um ano registrados no sistema de Informação sobre Mortalidade do Brasil (1996/2001). *Cadernos de Saúde Pública*, v.22, n.3, Rio de Janeiro, março de 2006. Disponível em: <http://cielo.br/pdf/csp/v22n3/22.pdf>.
- Seckin, G. (2010) Patients as Information Managers: The Internet for Successful Self-Health Care & Illness Management. *Open Longevity Science*, v.4, p.36-42.
- Souza, A . P.; Pereira, A . G. L.; Escosteguy, C. C. (2009). Análise da completude, consistência e indicadores epidemiológicos da tuberculose no HSE. *Boletim Epidemiológico do HSE/RJ*, n.38. Disponível em: <http://www.hse.rj.saude.gov.br/profissional/boletim/bol38/analise.asp>.
- Valle, A. B. et. al. (2010). *Sistemas de informações gerenciais em organizações de saúde*. Rio de Janeiro: FGV.
- Van Der Linden, H.; Kalra, D.; Hasman, A.; Talmon, J. (2009). Interorganizational future proof HER systems. A review of the security and privacy related issues. *International Journal of Medical Informatics*, n.78, v.03, p.141-160.