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**Abstract**

Nursing is a vocation whose main task today is to care for the sick and to protect healthy people. The nurse mainly takes care of the patient in the hospital and is a collaborator of the doctor in an effort to cure and recover the patient as soon as possible. The work of an outpatient nurse includes care for health and socially endangered persons, health care and education of patients at home, prevention of diseases and improvement of health in the community, and medical and administrative work with a doctor in the office; the outpatient nurse represent the framework of the patronage service. Traditionally, the work of community nurses has largely been reduced to providing health care or caring for a sick or healthy individual. In contrast to traditional nursing, public health care is increasingly directing nurses to work in the community as a whole and to work with groups of people. This does not mean diminishing the importance of working with individuals and their families, but nurses are increasingly involved in assessing the health needs of individuals and supporting family members and loved ones in developing skills and knowledge to protect their health and help others.

**Keywords:** Nurse, Nursing, EHR, Informatics, eHealth**Introduction**

One of the most significant developments in health and social care in recent years has resulted from the increased use of information technology (IT), in particular the Internet and the World Wide Web [1]. Accelerating the uptake of digital technologies and providing support for its implementation was identified as one of the recommendations to address the nine characteristics of good quality care in district nursing. Considering the changing demographics of society and the fact that advances in technology can save time and money, national strategies have identified eHealth as an approach to improve healthcare.

Many solutions have been proposed, such as the multiplication of healthcare suppliers, the establishment of general practitioners as gatekeepers for hospital admissions, the implementation of public health insurance schemes or the government support for reforms in favour of private health insurance and private healthcare providers [2]. However, they have not proven sufficient to solve all problems yet. Digital healthcare is likely to play an increasing part in addressing these issues. One of the strengths of e-health is the quick and widespread adoption of mobile platforms. This may help solve access challenges, through online appointment registration systems, models of online-offline services, two-communication platforms between patients and physicians, sharing information through the Electronic Health Record (EHR) and Electronic Medical Record (EMR) systems, the generalized implementation of a DRG-based payment system, making patients more increasingly active actors in maintaining

the health status, and improving the online drug market. On the flip side, this also raises many concerns regarding the confidentiality of personal medical data and the monopoly situation of some internet companies.

**eHealth**

The term eHealth first appeared in the literature in the 1990s but has since been increasingly and inconsistently used [1]. The widespread use of the term suggests it is a significant concept that is commonly understood despite the lack of a precise definition. The World Health Organisation encompasses the two universal themes and defines eHealth as ‘the use of information and communication technologies for health to, for example, treat patients, pursue research, educate students, track diseases and monitor public health.’ The Scottish Government suggests eHealth is an umbrella term with wide parameters and is defined as ‘the use of information, computers and telecommunications to meet the needs of individuals and improve the health of citizens’.

Within this definition of eHealth it is recognised that there are many evolving terms encompassed, such as health informatics, nursing informatics, information communication technology, assistive technology, telemedicine, telenursing, telecare, telehealth, electronic patient record, and they are often used interchangeably. It is not possible to cover them all in depth here; however, it is important that there is an understanding of the broad principles of the key terms, in order that technology can be used appropriately within the community.

Nowadays, one cannot deny that terms, expressions, and words are used indifferently and without distinction of meaning to qualify acts, trends, and practices that are generally related to telehealth [3]. As evidenced, a recent study revealed that the terms telemedicine, telehealth, and eHealth are used as synonyms, while in some cases, they designate a remote medical practice and define the act of care or refer to the tools and therefore the intermediation view of service production or healthrelated e-commerce. Different meanings words that are not without impact on the applicable legal framework and on the perception of than the legislator of the said act. To illustrate, let's take as an example the typical case of telemedicine. Two conceptions of telemedicine are classically opposed: in developed countries, telemedicine is essentially clinical, whereas in developing countries, it is more informative. Clinical telemedicine is understood as "a professional activity which implements means of digital telecommunication allowing doctors and other members of the body to remotely perform medical procedures for patients," while informative telemedicine is defined as "an audiovisual communication service interactive platform that organizes the dissemination of medical knowledge and protocols for the management of patients and care in order to support and improve medical activity." France is one of the first countries to have a legal basis for the practice of telemedicine through Law No. 2009–879 of July 21, 2009, known as the HPST law, and its October 19, 2010, decree. These two fundamental texts devote a clinical approach to telemedicine, defining it as a medical act performed by health professionals via information and communication technologies. In other words, telemedicine in France is a medical procedure performed by a health professional; its efficiency is recognized and it guarantees safe and proven medical knowledge. This definition traces a clear boundary of how other countries refer to telemedicine as any "health benefit" achieved through new technologies. The word difference, although minimal, is fundamental in that one refers to it as a medical act and the other a medical service. The word difference results in an applicable regulatory framework in particular. Therefore, in France, telemedicine comes under a specific legislation, whereas in Europe, it falls under the more general category of eHealth.

The wide scope of implementations of modern teleinformatic technologies in various areas of healthcare results in difficulties with a comprehensive, descriptive definition of telemedicine [4]. Interaction within the telemedicine domain may be carried out between various participants of the healthcare arena. Specifically, these contacts can be accomplished between health professionals, between patients and health professionals, between patients assisted by health professionals and other health professionals, between health professionals and organizations responsible for health maintenance, between providers and payers and many others. It is difficult to predict how long the term "telemedicine" will remain in our vocabulary as we face nowadays trends for technology convergence. In the future, separation of telemedicine from other areas of electronic activities will probably be impossible. Some experts also predict the disappearance of the concept of

telemedicine because they stipulate that at some moment most healthcare services will be based on the use of information and communication technologies.

There is no doubt that telemedicine is characterized by a multidisciplinary approach. Most existing definitions place stress on communication as well as on exchange of medical information with benefit for health or education status of patients and/or providers. The spectrum of terms with similar meaning is quite wide nowadays. Telehealth and e-health seem to be the broadest ones. Telehealth is a more generic term applied in the context of the use of information and communication technology (ICT) to deliver health services, expertise and information over a distance. It seems that currently, among all terms related to the use of information and communication technologies in the context of health maintenance, the concept of e-health has become the most universal one. Specifically, it is broader than telemedicine and can be described as an emerging field in the intersection of medical informatics, public health and business, that enables health services and information to be delivered or enhanced through the Internet and related technologies.

#### PHR

The electronic health (e-health) industry is not limited to the presence of the electronic health records (EHRs) and EMRs found in small and large health provider settings [5]. Rather, there are record-keeping mechanisms that are marketed to the consumer who also is typically the patient. The patient looks for easy access to stored records, ways to monitor his/her own care, and possibly a way to connect his/her own records to the hospital's records. This is all possible through a PHR, which has grown in presence and prevalence in the health industry today. Patients of all ages, from the technology savvy younger generations to the eldest senior citizens, are seeing value in PHRs due to how easy it is for patients to have control over their own records and take charge of their condition. PHRs allow for control and record keeping of comorbidities, public health issues and bioterrorism scares, provide quicker surveillance of disease in a region through instant mapping, monitoring of health conditions, and, finally, prevention of both diseases and illnesses.

Patient-controlled health records, also known as PHRs, are designed to assist individuals in managing their own conditions, health records, and healthcare services. Just how well they will anticipate the needs of patients and improve health outcomes remains to be seen. However, there is some correlation between the growth and use of electronic medical record systems and the spread of PHRs in the households of chronic disease patients themselves.

There are a number of products—ranging from mobile phone applications to software programs to online sites—that provide patients easy access to their own health records. While the early beginnings of PHRs were actually paper-based, the current market contains a combination of computer-based products that store patient data on a flash drive or CD, and

Internet-based programs that allow for password-protected organization and input of health information. There are also hybrid-style services that are available both on CD, flash drive, and other devices as well as online.

In addition, smart phones with Internet capabilities that can be used to support health management support tools, also known as mobile health, are a growing trend in PHR usage. “M-health” (also known as mobile health or Mhealth) varies greatly in PHRs. While some mobile applications spread awareness or give research capabilities to individual patients, others are used to support particular healthcare needs, conditions, and concerns. Each application utilizes things like interactive games and texts to raise awareness of patients regarding disease surveillance, remote data collection, and epidemic outbreak tracking.

### Nursing Informatics

Health informatics is generally defined as ‘the knowledge, skills and tools which enable information to be collected, managed, used and shared to support the delivery of healthcare and to promote health’ [1]. Despite this definition being dated it is still regularly cited today. Nursing informatics is similar in that it is the collection of data and use of information to support nursing practice. This encompasses the electronic patient record. The development of infrastructures to support health and nursing informatics is a priority within national policy.

Record keeping is an essential element of nursing practice and includes all records that are relevant to your scope of practice. The electronic patient record is, as it sounds, an electronic copy of a person’s nursing or medical record. The aim within the NHS (National Health Service) is for a single integrated electronic health record to be available to authorised users, including the service user. In the United Kingdom, the development of the healthcare record is at varying stages, with some general practice (GP) surgeries having used electronic records for many years. However, the challenge is for the record to cross primary and secondary care boundaries, and to be a fully integrated health and social care record, allowing access to authorised individuals while safeguarding patient confidentiality.

Nursing informatics is “a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom in nursing practice” (ANA, 2008.) [3]. The American Nurses Association (ANA) first recognized nursing informatics as a specialty nursing practice in 1992. However, nurses have been working to advance the field of nursing informatics for the last several decades. More recently, the field of nursing informatics has shown dramatic growth. As a result of that growth, nurses will have new opportunities in roles as informaticists within health care organizations that did not exist decades ago or even a few years ago (depending on the health care organization). The roles will span from an executive level as a Chief Nursing Information Officer (or Chief Information Officer) to a Nurse Informaticist as part of a Clinical or Nursing Informatics

Department within the health care organization or working in an industry role with an EHR (Electronic Health Records) vendor or other HIT (health information technology) company. Nurses also have the opportunity to become board certified by the American Nurses Credentialing Center (ANCC) in Informatics Nursing.

The opportunities for nurses as informaticists will continue to expand in health care organizations as the use of EHRs and emerging technologies continue to become integral to the delivery of patient care. The dependency on electronic solutions requires an understanding of the nursing science, computer science, and information science in order to critically evaluate and integrate new technologies into the health care organization. Understanding these scientific domains is part of the role of a nurse informaticist. The opportunities to work as a nurse informaticist within a health care organization may range from a Chief Nursing Information Officer and/or a Chief Information Officer to that of an entry level informaticist. Additionally, the presence of Clinical or Nursing Informatics Departments as part of the organizational structure of health care organizations will continue to grow across the nation.

### EHR

Electronic health records (EHR), also known as electronic medical records (EMRs), continue to be one of the most controversial yet important topics in health informatics [6]. As an essential component of the national health information technology (HIT) strategy and healthcare reform, widespread adoption of EHRs will likely help reform the delivery and quality of medical care. However, EHRs also present many new challenges. There are mixed reports as to whether the adoption of EHRs will consistently produce improved medical quality and patient safety or reduce healthcare costs. Some question whether improvement in medical care due to EHR use will take many years to occur and whether only large, integrated delivery network-type healthcare organizations will experience these gains.

There is no universally accepted definition of the electronic health record. Informally, the EHR is a digital collection of patient health information compiled at one or more meetings in any care delivery setting. A patient’s record typically includes patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports. The term EHR is often used to refer to the software platform that manages patient records maintained by a hospital or medical practice. Formally and historically, the EMR is the EHR in one location or office and is owned and operated by the healthcare provider or system. Personal medical records (PMRs) is a term used that represents electronic medical records that are owned and maintained by the individual patients themselves. Other terms such as computerized medical record (CMR), electronic clinical information system (ECIS), and computerized patient record (CPR) are rarely used.

EHRs are, at their simplest, digital (computerized) versions of

patients' paper charts. But EHRs, when fully up and running, are so much more than that. EHRs are real-time, patient-centered records. They make information available instantly, and most importantly are universally and securely accessible to authorized persons. These systems bring together in one place everything about a patient's health.

EHRs can (1) contain information about a patient's medical history, diagnoses, medications, immunization dates, allergies, radiology images, and lab and test results; (2) offer access to evidence-based tools that providers can use in making decisions about a patient's care; (3) automate and streamline providers' workflow; (4) increase organization and accuracy of patient information; and (5) support key market changes in payer requirements and consumer expectations.

### Privacy

Nurses have an ethical responsibility to protect the patient's privacy and confidentiality of shared information [7]. Nurses of all roles are expected to uphold the Code of Ethics set forth by the American Nurses Association. The Code of Ethics states, "The nurse promotes, advocates for, and strives to protect the health, safety, and rights of the patient". The concepts of privacy and security are embedded within that statement. Protecting the privacy of patient data and health information has always been an expectation of nurses. However, the use of EHRs and other electronic methods of exchanging information rapidly expanded over the last two decades. With such expansion, health care organizations are faced with greater risks of compromised security of patient health data and information. Thus, health care organizations are tasked with ensuring patients' protected health information (PHI) adheres to the privacy and security provisions and regulations.

The terms privacy and security are interrelated with one another but do have different meanings. The first core component of an EHR is health data and information. The health data and information is about individual patients. In order to ensure a patient's health data and information remains private within EHRs and adheres to regulatory requirements, the health care organization must ensure the security of the data and information.

Regardless of whatever privacy measures are in place, the sharing of highly sensitive data always entails a danger of misuse, unintended or unwanted disclosure [8]. A highly secure eHealth infrastructure is paramount for the welfare and better treatment of people who participate in work or interact with the health system. That is where data protection provisions play a pivotal role for both the legal framework and the technical specifications of the eHealth infrastructure. It goes without saying that data protection rules for such a wide-area EHR platform are far beyond those for the above-mentioned isolated or local-area systems. Effective enforcement of these privacy laws and rules must also be backed by appropriate technical solutions on the basis of the latest state of technology (privacy by design).

Access must be limited, by all means possible, to a group of authorized users, and individual health data evidently must be protected from its inception and throughout the operative life of the system. The separate storage of patient-identifying data and pseudonymized and encrypted storage of the medical reports are another important step to protect the data against criminal administrators and against illegal intruders. Medical information may not be stored at all, other than in encrypted form.

Exchanging selected information, with legal and verified requesters, requires re-encryption of these documents. Briefly, at the time when information is provided for a wide-area EHR of one patient, the provider may not know who may access this information in the near, or far-off, future. Encryption for an intended recipient is not possible. The information is encrypted for the EHR system as receiver. As soon as a legal requester appears, the server will re-encrypt the information for the real recipient. A simple re-encryption of information runs the risk of disclosing the report to an administrator or intruder during the re-encryption. A two-stroke encryption of the medical information is necessary to allow re-encryption without disclosure to administrators or intruders.

### Future

In our survey several of the respondents looked for a comprehensive e-enabled healthcare system, standardised and interoperable which meets the necessary legal and functional requirements for optimal, seamless, cross-border delivery of services [9]. Implementation of such a system is expected to lead to more equal, accessible, holistic and human-centred healthcare.

In the future we suppose that several Internet-related and other trends will have influence on the design, content, functionality, dissemination and use of future the globalisation increasing number of eHealth resources will be developed overseas and for global audience. Thus standardisation and cross-cultural factors will become increasingly important.

The digital generation will most likely demand immediate access to information and will rely on online resources to inform health and other decisions. Wireless technologies may contribute to the growth of mobile eHealth applications for both providers and consumers. Digital television may serve in the future as a cheap and easy platform to offer eHealth systems and information for large audiences. Personalisation and tailoring of applications to specific users will put emphasis on privacy and data security issues.

### Conclusion

eHealth can be defined as a set of professional and business health procedures and processes supported by electronic information and communication services. eHealth encompasses information systems in healthcare institutions, including electronic health records, the distribution of health information, medical research, and online services for health system users. Health informatization is a project that lasts because new

needs, new technologies, new ideas and new possibilities are constantly coming. It has been shown that healthcare and information technology have become inseparable today. The world is working intensively on the informatization of health care, and the main requirement is the construction of an integrated health information system. It should be taken into account that information technology is increasingly available to patients, so it is expected that in the near future, patients will participate in the collection of their health data through a personal electronic health record. eHealth enables better, safer, more efficient and economical provision of health care and system management, as well as better communication of all stakeholders in health care, for the benefit of patients, health professionals and society as a whole.

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