From Medical Records to Health Knowledge Management Systems: The coding to health sector

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Abstract: *One of the most significant challenges in health care is the ability to effectively manage information. Information technology has already the potential role to transform the way work in the health care environmental. Health Information Management and Technology (IM&T) has been around for more than two decades. Both help clinicians to achieve better delivery of care.*

Medicine is too complex for any human to carry in one mind all of its knowledge, and to remember everything about each patient. Creating and indexing records for hospitals and health systems present difficult challenges, because the medical records contain sensitive information, and increasing computerization and other policy factors have increased threats to their privacy. Transforming from paper-based to Electronic Medical Records (EMR) allows healthcare providers to share information across their care ecosystem. Access to this digital lifeline, connecting the EMR to the digital web platforma, is critical to saving lives, preventing medical errors and improving efficiency of healthcare delivery. Information Technology is an answer to that, a vital element of better delivery of care is to ensure that the patient is always at the centre of our attention.

Keywords: *Electronic Medical records, Health Information management, ICD codes, Hospital information systems..*

I. INTRODUCTION

Over the years we have proceeded step by step towards creating a coherent environmental in the NHS, "making it Work" has became the key phrase. Many authors date its beginning back to the Paperwork Reduction Act of 1980 in which U.S. Federal agencies were forced to introduce information resource management. These information policies were intended to reduce the total amount paperwork handled by the US government and the general public. The basic purpose was to provide for the dissemination of public information on a timely basis, on equitable terms, and in a manner that promotes the utility of the information to the public and makes effective use of information technology.

II. HEALTH INFORMATION MANAGEMENT

With the changes in Information Technology affecting health organizations and with the increasingly high profile of information as a valuable resource, there have been significant changes in information personnel. In 1986 purchasers and district British health authorities (DHAs), who have responsibility for buying healthcare for their resident populations, and general practitioner fundholders, negotiate a strategy for primary care :towards a primary care-led NHS. To do this will was required extensive information from many sources. The strategy for primary care was also becoming a strategy for the NHS. In 1995 the national Health Service Executive (NHSE), published proposals for the extension of fundholding capability to a wide range of practices. These proposals were part of the overall strategy and carry their own information implications in accordance with the movement of decision making closer to the point of care delivery. Practices are obliged to handle a wide range of information types. Particularly for instant images are generated, used and stored for patient care, diagnosis, education and administration. Recent results by the National Statistical Service of Greece and by the Ministry of Health and Welfare (ESY.net) found that in an average Greek hospital, up to one million images are generated every year, and archiving has became a major problem. Computerised record keeping in primary private care is increasing with significant differences in general practice record keeping. In primary public care most, if not all, of the existing image database systems are experimental or prototype, depending on whether the practice uses paper records, computerised records, or a hybrid system.

These types may be a grouped broadly as:
- Patient records information-clinical, social, administrative
- Medical – welfare information for patients
- Information about the practice for patients
- Management information relating to external agencies
- Professional training and updating information (on drugs, online sources..)

According the history of EHRs (Colon,2002) the first medical record was developed by Hippocrates, in the fifth century B.C., which prescribed two goals. The first goal reflects the course of disease, and the second

indicate the cause of disease. Until recently, all patients' records were paper-based. Every time a patient was admitted to hospital many factor would be completed and added to their folder. Many hospitals in the world are now switching over the computerised record keeping. These Hippocrates goals are still appropriate, but electronic health record systems can also provide additional functionality, such as interactive flow sheets, higher quality of care with real-time information and collaboration between clinicians, connect health professionals and patients so that they have the right information they need, decreasing redundant documentation, actions, and clinical testing. The Health Information Systems Society's (HIMSS) the definition of electronic health record (EHR) is "a secure, real-time, point-of-care, patient centric information resource for clinicians. The EHR aids clinicians' decision making by providing access to patient health record information where and when they need it and by incorporating evidence-based decision support. The EHR automates and streamlines the clinician's workflow, closing loops in communication and response that result in delays or gaps in care. The EHR also supports the collection of data for uses other than direct clinical care, such as billing, quality management, outcomes reporting, resource planning, and public health disease surveillance and reporting."

Early Investigators (Summerfield and Empey,1965; Evans et al., 1985) reported that the first EHR began to appear in the 1960s. By 1965, at least 73 hospitals and clinical information projects and 28 projects for storage and retrieval of medical records and other clinically relevant information were underway. Many of today´s electronic health records are based on the pioneering work done in academic medical centers and for major public clinical care organizations. According some important notes on data for EU countries related the computerising record keeping systems:

> COSTAR (the computer stored ambulatory record) developed to Harvard, placed in public domain in 1975
> HELP (Health evolution through logical processing) developed to Latter-Day Saints Hospital, University of Utah in the late 1960s.
> TMR (the medical record) the Duke Hospital Information System (DHIS).
> the Mayo Clinic's integrated clinical and research data, being developed with IBM

Recent research (Flowerdew,1974; Golderberg and Lorin, 1982; Hamilton et al., 2003) on the effectiveness of an information services found has long tradition and there are several good review studies available. In 1992 the Health Information Management team at the Department of Information and Library Studies completed and investigation of information perceptions, information use and information flows in respect of these information types within five general medical practices in Wales. According the main results of the research, there were a number of core activities listed

below as: so many new patient records were disorganized that all the practice had instituted a system for dealing with them, parallel records were kept, from both sites by practice and by health professionals. So they increase the risk that data is not shared and there is a potential duplication of effort.

In 1994, the Information Management group of the National Health Service in the UK, including community care units, and the World Health Organization (WHO), in cooperation with the professional body of the Institute of Information Scientists, develop and promote the use of evidence-based tools, norms and standards to support Member States to inform health policy options. Later, in European Hospital Healthcare Congress in 2001, which be held on London, the countries of Europe, even they use different strategies for improving hospital performance, decided to do much together in the field of public health. The main point was: we need more communication between policy makers responsible for economic policy and social policy, there is a lack of communication. Similar issues were: the adoption of communication protocols, the use of videoconference for distance consultation and medicine, all patient management and records software in the hospitals, the needs of patients are the raison d'etre of every institution in healthcare.

Early in 2008, WHO defined three standards for classification and terminology used in Health Care Information Systems: ICD/International Classification of Disease, ICF/International Classification of Functioning, Disability and Health, and ICHI/International Classification of Health Intervention. The ICD is the international standard diagnostic classification for all general epidemiological, many health management purposes and clinical use. The ICF is WHO's framework for measuring health and disability at both individual and population levels. The first International Classification of Procedures in Medicine (ICPM) was published in 1978. The purpose of this classification is to provide Member States, health care service providers and organizers, and researchers with a common tool for reporting and analysing the distribution and evolution of health interventions for statistical purposes. As stated in the white paper on ICD (WHO, 2007), has defined standards for classification and terminology used in Health Care Systems. Now ICD10 has about 16 thousand terms. New forms of management information result from this, a range of services was listed from sets standards for classification and terminology used in Health Care Information Systems. In order to transfer the e-patient record from an information to a knowledge-based system, the new vision of ICD aims to guide the classification and representation of knowledge of clinical data.

In some EU countries we are seeing a gradual move away from hospitals as the enterprices of clinical practice towards clinical networks that seek to integrate the total patient experience. In the framework of the

INTEGRATED INFORMATION

Health Monitoring System, the Ministry of Health in co-operation with the WHO-Euro organised an educational workshop for the International Disease Classification System ICD-10 concentrating on the improvement of the quality of mortality data in Greece and Cyprus. At the same time, there was an initial reference to the disease coding (morbidity). Some officers were selected for training in the morbidity coding, so another educational workshop will be organised for this purpose in the near future. Doctors, nurses and secretaries from the Ministry of Health as well as officers from the Statistical Service and the Ministry of Interior participated in the workshops. A union policy about the Health Systems is to develop a national strategy for integrating healthcare Information Technology (IT) solutions, adopting IT solutions for healthcare services. Worldwide priority is to find solutions with IT:

- to reduce the health care cost,
- to improve quality and patient care
- to increase the flexibility both health care providers (in improving their use of resources and efficiency) and patients (by improving better services).
- to offer new opportunities and challenges with positive outcomes.

Electronic image management is another issue in Healthcare Market. According classic writers, there is an increasing need to manage images from a range of clinical sources and their associated reports from all sources into one electronic patient record (EPR).

Even computerization and the use of IT in Healthcare began in Finland during the 1970s, the main challenge is to specify the interactive information system that will connect different service units and hospitals in the region. So the patients involve, in many countries, from a passive factor in active collaboration between the different stakeholders and patient's organizations. The traditional European model of the doctor - patient relationship with doctors talking, patients listening are redundant. In place, clinicians and managers have to deal with informed patients, who demands the best delivered health services to the community in which they live. Similar developments can be seen across USA, with patient involvement in health services management and planning. The exchange of information gave them a sound. In more recent times we have seen a joining together of these groups not just at national level but also on a European and global level. The International Alliance of Patients Organizations (IAPO) is the final step in this process.

III. CONCLUSIONS

In summary, a number of studies have directly measured the benefits of using IT, using a variety of managerial methodologies in different healthcare environments. Thus researchers have studied how to develop and integrate the medical ontologies, apply them to medical knowledge management. By using the patient records data and ontological representation and

rules, new clinical/ medical knowledge can be created and discovered. The literature supports the value of using especially in the areas of medication safety, patient disease support, and economic value, manage information. To do this well requires extensive information from many sources. The maintenance of a complete and comprehensive patient record will enable the practice to collect and store nearly all of the information necessary for it to function effectively. General practice staff be guided and assisted in adopting written protocols for the creation and maintenance of clinical records, also require access to systematic training programmes to cover records management strategies, standards should also specify the required search access which record systems must permit.

The use of information is to denote knowledge imparted, and to denote the process of informing, as a byproduct of care delivery and documentation all patient information needed to support coding, clinical trials and evidence based research.. The most important element of the in patient contract minimum data set, as well an important aspect of statistical analysis, is coded diagnoses. All the patient data can be represented in a semantic manner, building and using a medical ontology for knowledge management and cooperative work in a health care network The NHS needs to share information extensively to meet its aspiration.

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