Health and Clinical Management —
From Patient Care to National Public Health
Increasing the Integration of all Health Care Participants and
Systems Interoperability for Better Care Management

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Summary

Objectives: To present some of last year’s best papers in the field of health and clinical management.
Results: The selected articles illustrate how IT is enlarging its role in health care management. By getting closer to patients allowing them feeding systems with their health data, IT can improve patient health management directly at patients’ home. With data being documented in increasingly more structured and standardized way, health information systems can better integrated and reuse that data and offer more decision support to physicians and other health professionals. Furthermore, as more data is available in electronic format in real-time, entire populations’ health status can be monitored by public health authorities allowing for better public health management.
Conclusions: Although the selected articles are only a few bricks in global health management, they are promising examples of how IT improves the integration and collaboration between all participants in health care and offers support at all levels. Tying all these separate bricks together still require work, as well as developing all the remaining bricks, but systems interoperability allowing for data sharing and health participants collaboration are continuously getting more real.

Keywords
Medical informatics; International Medical Informatics Association; yearbook; decision support systems; management; patient care management; public health informatics

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Introduction

As information technology (IT) becomes increasingly more ubiquitous in health care, medical data is input in electronic health applications by almost all participants of the care process, ranging from institutional care providers to private practitioners and even by patients themselves [1, 2]. As one single patient interacts with an increasing number of care providers, it seems obvious that each provider should have access to all the data concerning that one patient, thus expecting systems to interoperate. But in order for systems to efficiently collaborate, they need to exchange meaningful data that is, they need to use the same semantics [3, 4].

As electronic health information systems are asked to provide increasingly more help in health care management, they become more complex. It is no more sufficient for systems to store data and make it available for retrieval on user request, but they are asked to bring proactive decision support, at many levels. For such functionality, when data is made available in a system, that data should be notified to any component of the system that might make use of it. For example, as a positive result from laboratory tests for a notifiable disease is available, the system can be expected to extract from the electronic patient record all the data relevant for the notification of that disease and automatically report the case to the surveillance authority [5]. When new laboratory data suggesting renal insufficiency are available, the system should, if pertinent, readily suggest the physician to adapt the dosage of relevant drugs already prescribed for the patient and not use that laboratory results only for future prescriptions that will be made. Such data reusability across a platform is of particular value as health care is evermore multidisciplinary which requires better data integration and communication among the various providers [6].

Such functionalities, although of great help in patients’ health care management, make systems increasingly more complex as any given component of the system may be impacted by any kind of data from virtually any other component of the system. Thus the components of one given system need to interoperate.

With an increasing number of electronically available medical data, IT has an increasing potential in helping in health care management. But as the systems become more complex and are expected to deliver increasingly more complex expertise, the goals are still challenging.

Best Paper Selection

Each of the five papers selected for this yearbook focus on different aspects of health care management. Ranging from single patient’s health care management at home to national health surveillance, through health information systems
design and analysis, these articles give a nice overview of what IT offers in health care.

The importance of patient's direct involvement in the health care process, particularly in chronic disease management, makes no doubt. In the continuation of some studies that evaluated IT interventions for home monitoring of patients with chronic disease like diabetes [7] or hypertension [8], last year's study by O'Shea [9] showed promising results in the management of outpatients’ oral anti-coagulation treatment with the help of a computerized expert system, and further enhances the role IT will play at the patient’s side.

At the inpatient level, IT is expected to help clinicians manage the increasing amount of data collected about their patients. Meystre’s paper [10] is a good example of how valuable clinical data can be extracted from electronic documents and put in front of physician’s attention, thus reducing the risk of information being overlooked and reducing the time for specific conditions being taken in consideration.

From helping single patient’s in the management of their health, to helping drawing physicians’ attention at valuable information, IT now even helps in entire national population’s surveillance. While tools aimed at grouping ICPC-coded diagnoses from general practice physicians’ electronic medical records show promising results [11], thus opening perspectives for better surveillance of incidence and prevalence of diseases in general population, Wu et al. [12] present in their paper how a national epidemic real-time surveillance system was set in Taiwan, based on data collected in the country’s hospitals’ emergency departments.

Among the benefits IT is expected to bring in health care management, reduction in medical errors is another one. In the particular area of medication-related errors, CPOE plays an important role. A lot has been published on this topic, particularly after that Han et al. [13] found, in 2005, an increased mortality rate after implementation of a CPOE in a paediatric setting. On the medication-related adverse events, it is worth highlighting Walsh’s paper on a comprehensive analysis of such events [14] as it gives a better understanding of the king of tailoring a system may need in a specific context so it can better reach its goals.

Finally, the last selected article takes an insight in system architecture. Although Van Hoecke et al. focused on the design of a platform for management of medical decision data in the ICU for easier integration of the growing number of medical decision support services [15], their work is valuable as their approach is valid for other settings outside the ICU. In fact, their approach is very interesting for designing entire health information system as it might help deal with their evermore higher complexity.

Conclusions and Outlook

Although all the work published last year in the field of health and clinical management is much more than can be summarized here, the five selected articles cover a broad range of the topic. They not only present promising results, but convincingly illustrate how IT can bring substantial help at the many different levels of health and clinical management.

Acknowledgement

I greatly acknowledge the support of Martina Hutter and of the reviewers in the selection process of the IMIA yearbook.

Table 1: Best paper selection of articles for the IMIA Yearbook of Medical Informatics 2009 in the section ‘Health and Clinical Management’. The articles are listed in alphabetical order of the first author’s surname.

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References


Appendix: Content Summaries of Selected Best Papers for the IMIA Yearbook 2008, Section on Health and Clinical Management*


* The complete papers can be accessed in the Yearbook’s full electronic version, provided that permission has been granted by the copyright holder(s).
some controversial results, particularly in the paediatric setting, have been found. The authors present their work on a comprehensive evaluation of medication errors before and after a commercial CPOE system implementation in a paediatric setting.

Their analyses found that incomplete or wrong medication orders were significantly lower after CPOE implementation, as could be expected of a CPOE system, whereas errors related to drug dosage slightly increased after CPOE implementation. Analysing the type of medication dose error showed that although the studied CPOE system had a weight-based automatic dose-checking, the system was not properly designed to address drug under-dosing, particularly relevant in the paediatric setting.

Wu, TJ, Shih FF, Yen M, Wu JJ, Lu SW, Chang KC, Hsiung C, Chou J, Chu, Y, Chang H, Chiu C, Tsui FR, Wagner MM, Su I, King C

Establishing a nationwide emergency department-based syndromic surveillance system for better public health responses in Taiwan

BMC Public Health 2008 Jan 18;8:18

This paper presents the development of an emergency department-based nation-wide real-time syndromic surveillance system in Taiwan where about 80% of hospitals distributed all over the country have electronic health information systems. Collected data came from nurses’ triage stations and physicians’ clinical assessments and included demographic data such as date of birth or home zip-code and clinical data such as body temperature, triage categories, chief complaints diagnostic ICD-9 codes.

Data analysis showed some not previously detected situations like a summer peak in visits for influenza-like syndrome before the annual vaccination campaign thus giving valuable information for public health care management.