

# Electronic Patient Records and their Benefit for Patient Care

## Findings from the Section on Patient Records

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### Summary

**Objectives:** To summarize current excellent research in the field of patient records.

**Method:** Synopsis of the articles selected for the IMIA Yearbook 2006.

**Results:** Current research in the field of patient records analyses users' needs and attitudes as well as the potential and limitations of electronic patient record systems. Particular topics are the questions physicians have when assessing patients during ward rounds, the timeliness of results when ordered electronically, the quality of documenting haemophilia home therapy, attitudes towards patient access to health records and adequate strategies for record linkage in dependence on the intended purpose.

**Conclusions:** The best paper selection of articles on patient records shows examples of excellent research on methods used for the management of patient records and for processing their content as well as assessing the potential, limitations of and user attitudes towards electronic patient record systems. Computerized patient records are mature, so that they can contribute to high quality patient care and efficient patient management.

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### Keywords

Medical Informatics, International Medical Informatics Association, Yearbook, medical records, computerized medical records systems

## Introduction

Methods on electronic patient records “should primarily improve the quality of care, reduce errors, improve communication between multiple specialists, reduce wait times for patients and improve efficiency” [1]. To approach this, research on patient records covers areas from patient safety [2] via new technologies [3, 4] to managing genomic information [5]. To document the effectiveness of these approaches the impact of innovative patient record systems is being assessed [6].

## Best Paper Selection

The best paper selection of articles for the section ‘patient records’ in the IMIA Yearbook 2006 reflects these trends and follows the tradition of previous yearbooks [7,8] in presenting examples of excellent research on methods used for the management of patient records, the processing of content of the patient records and on assessing the potential, limitations and user attitudes of electronic patient record systems.

Five excellent articles representing the research in four different nations were selected from five international peer reviewed journals in the fields of medicine and medical informatics. Table 1 presents the selected papers. A brief content summary of the selected best

papers can be found in the appendix of this report.

## Conclusions and Outlook

The best paper selection for the Yearbook section ‘patient records’ clearly indicates that computerized patient records are mature, so that they can contribute to high quality patient care and efficient patient management [12, 16]. Nevertheless, for optimum usability, we need to better understand the information needs of physicians in particular situations of their daily work [9]. If such results are used for the design of user interfaces, the perceived usefulness of electronic patient records may increase [19]. This is also important for patients as potential users of electronic health records. [15] confirms the willingness of patients to access their own patient records as shown in earlier studies [20]. If patient records are used by patients for a relevant task as demonstrated in [16], they have the potential to increase both the quality of the health care process and the quality of life.

Up-to-date information about current and future issues of the IMIA Yearbook is available at <http://iig.umat.at/yearbook/>.

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**Table 1:** Best paper selection of articles for IMIA Yearbook of Medical Informatics 2006 in the section 'patient records'. The articles are listed in alphabetical order of the first author's surname.

Section
Patient Records
<ul style="list-style-type: none"> <li>▪ Pyper C, Amery J, Watson M, Crook C. Access to electronic health records in primary care—a survey of patients' views. <i>Med Sci Monit</i> 2004; 10: SR17-22.</li> <li>▪ Quantin C, Binquet C, Allaert FA, Cornet B, Pattisina R, Leteuff G, Ferdynus C, Gouyon JB. Decision analysis for the assessment of a record linkage procedure: application to a perinatal network. <i>Methods Inf Med</i> 2005; 44: 72-9.</li> <li>▪ Reuss E, Menozzi M, Buchi M, Koller J, Krueger H. Information access at the point of care: what can we learn for designing a mobile CPR system? <i>Int J Med Inform</i> 2004; 73: 363-9.</li> <li>▪ Thompson W, Dodek PM, Norena M, Dodek J. Computerized physician order entry of diagnostic tests in an intensive care unit is associated with improved timeliness of service. <i>Crit Care Med</i> 2004; 32: 1306-9.</li> <li>▪ Walker I, Sigouin C, Sek J, Almonte T, Carruthers J, Chan A, Pai M, Heddle N. Comparing hand-held computers and paper diaries for haemophilia home therapy: a randomized trial. <i>Haemophilia</i> 2004; 10: 698-704.</li> </ul>

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## Appendix: Content Summaries of Selected Best Papers, Section Patient Records\*

Pyper C, Amery J, Watson M, Crook C.  
Access to electronic health records in primary care—a survey of patients' views.  
*Med Sci Monit* 2004; 10: SR17-22

Physicians are no longer the only users of electronic patient records: Progress in data privacy issues [13, 14] and available technologies nowadays enable patients to access their electronic health records. Therefore, [15] analyzed the attitude of more than 500 patients towards online access to the electronic record and health information in primary care. Nearly half of the patients who answered were experienced in using computers, and more than 80% thought they should have access to their health record. Although more than 70% know about their right to access, only 4.5% had already asked to do so. Nearly 60% would like to see their records if they were available electronically. Major concerns were still confidentiality, security, accuracy and completeness of patient records. The authors emphasize that patient access to

\* The complete papers can be accessed in the Yearbook's full electronic version, provided that permission has been granted by the copyright holder(s)

their electronic records needs to be developed in partnership with the patients and that it will impact the way health care professionals record patient information.

Quantin C, Binquet C, Allaert FA, Cornet B, Pattisina R, Leteuff G, Ferdynus C, Gouyon JB.

Decision analysis for the assessment of a record linkage procedure: application to a perinatal network.

Methods Inf Med 2005; 44: 72-9

Medical records are not only used for patient care but also for administrative tasks, quality management, clinical trials and epidemiologic studies. Especially in biomedical research, data linkage becomes necessary if patient data may be distributed over several registries [17]. According to [18], which was selected for the yearbook, the appropriate linkage strategy is dependent on the purpose of the linkage. For statistical use, "erroneous linkage ... will not lead to major distortion in the probabilistic result, if these errors are not too frequent. On the contrary, the repeated lack of record linkage for patients having specific profiles can lead to significant bias" ([18], p 72). For medical use, it is essential to avoid erroneous linkage of another patient's data, thus linkage strategies with high specificity should be selected. The authors tested several linkage strategies with the example of registry data of the Burgundy Perinatal Network, and suggest particular strategies for the various purposes.

Reuss E, Menozzi M, Buchi M, Koller J, Krueger H.

Information access at the point of care: what can we learn for designing a mobile CPR system?

Int J Med Inform 2004; 73: 363-9

Clinical application systems like the

electronic patient record are no longer restricted to administrative tasks. The challenge is to support the health care professional with relevant information at the point of care [9]. Since health care professionals move frequently during their daily work, they regard the provision of mobile tools as highly relevant. To investigate the physician's needs in this context, the authors analyzed what information was accessed, what data was entered and what typical sequences of data access and entry are by observing the physicians' interactions with the patient record during ward rounds. They found that about 50% of all patient record accesses were about medication, vital signs and laboratory results. Furthermore, the access preferences of physicians depend on what entity has been accessed previously. They conclude that the navigation offered by mobile tools should be adapted to the observed access frequencies. This should lead to higher efficiency and acceptance of electronic patient records.

Thompson W, Dodek PM, Norena M, Dodek J.

Computerized physician order entry of diagnostic tests in an intensive care unit is associated with improved timeliness of service.

Crit Care Med 2004; 32: 1306-9

Computerized physician order entry (CPOE) continues to be a major topic in medical informatics research. Many papers in this context focus on medication errors [10, 11]. The paper selected for the yearbook, however, analyzed the timeliness of test results when ordered by CPOE [12]. They performed a study in an eleven-bed medical-surgical intensive care unit to measure the timeliness of urgent laboratory and imaging tests before and after CPOE was introduced. For the laboratory test the time intervals were analyzed between the

time the test was ordered and the time

(1) the specimens were obtained

(2) the results were reported.

Both time intervals decreased significantly with  $p < 0.001$  (from 77 minutes to 21.5 minutes and 148 to 74 minutes respectively). The same effect was observed for the time interval between ordering and completion of images. The authors conclude that this improvement in timeliness means an improvement in quality of patient care.

Walker I, Sigouin C, Sek J, Almonte T, Carruthers J, Chan A, Pai M, Heddle N.

Comparing hand-held computers and paper diaries for haemophilia home therapy: a randomized trial.

Haemophilia 2004; 10: 698-704

The article of [16] also deals with the topic of involving the patients in their own care. In Canada, hemophilia patients have the opportunity to participate in a home care infusion program. On the one hand this increases the independence of the patient; on the other hand it makes it rather difficult to monitor the treatment and its consequences, e.g. as regards progress or complications. Participants of the program are regularly requested to deliver information to the treatment coordinating center on the infusions administered at home and on complications. The objective of the study was to determine if there were differences in protocol adherence, information delivery and data accuracy in patient groups with paper diaries in comparison to hand-held computers for data recording. The accuracy of data proved to be the same in both groups, but users of hand-held computers were clearly more adherent and timely with record-keeping and delivery than those using paper diaries. In addition, the clinic staff observed the advantage that the records were always legible.