Annotated Bibliography

Connected: Communicating and Computing in the Exam Room

Institute for Health Care Communication
171 Orange Street, 2R, New Haven, Connecticut 06510-3111
(800) 800-5907
www.healthcarecomm.org
**Citations of note / highly recommended reading**


Although social and behavioral factors influence health and mortality, such determinants are often ignored in clinical practice. A few, such as smoking and alcohol use, are commonly assessed by primary care physicians, but many others may be viewed as outside the scope of medical practice. Calls for clinicians to attend to these factors are increasing, and several developments are accelerating the medical community's interest in addressing them... Including a concise panel of standard measures of social and behavioral determinants in every patient’s EHR will increase clinical awareness of the patient’s health status and enable clinical, public health, and community resources to work in concert. We hope that the existence of newly aligned incentives and a readily adopted standard set of measures will motivate EHR vendors to incorporate the IOM-recommended measure panel into their products, health systems to adopt its use, and clinicians to incorporate the newly available information into their care of patients.

Als A: (Institute of General Practice, University of Aarhus, Denmark.) The desktop computer as a magic box: patterns of behaviour connected with the desktop computer; GPs’ and patients’ perceptions. Family Practice, 1997;14:17–23

BACKGROUND: The use of computers in general practice is becoming increasingly common. There has been concern about effects on doctor-patient communication.

OBJECTIVES: The aim of this study was to identify common patterns in the use of desk-top computers by GPs with regard to interaction with the patients, and to assess the GPs’ and patients’ perceptions of the use of the computer.

METHOD: Thirty-nine video-taped consultations with five different GPs were analysed inductively, inspired by the principles of ‘grounded theory’. On separate occasions the five GPs and 12 of the previously video-taped patients watched and commented on the video recordings of their own consultation.

RESULTS: The study showed that the computer was sometimes used in a way that was not originally intended. Use of the computer could be identified as a way of obtaining ‘time-out’ in the consultation. It could also be a referral to a ‘magic box’. The conversation often changed when the computer was used. The interviews showed that the patients lacked understanding about the computer’s functions. They also lacked knowledge about the possibility of loss of confidentiality with electronic files. The patients found it disturbing not knowing what their doctor was doing when he worked on the computer, and they preferred being able to see the computer screen. The GPs were surprised at how their own use of the computer looked on the video, and as a result of the interview they wanted to change their behaviour.

CONCLUSIONS: It is concluded that patients need more information about the use of computers by GPs, and that GPs may benefit from paying more attention to their computer use.


OBJECTIVE: Use of electronic health records (EHRs) in primary-care exam rooms changes the dynamics of patient–physician interaction. This study examines and compares doctor–patient non-verbal communication (eye-gaze patterns) during primary care encounters for three different screen/ information sharing groups: (1) active information sharing, (2) passive information sharing, and (3) technology withdrawal.

METHODS: Researchers video recorded 100 primary-care visits and coded the direction and duration of doctor and patient gaze. Descriptive statistics compared the length of gaze patterns as a percentage of visit length. Lag sequential analysis determined whether physician eye-gaze influenced patient eye gaze, and vice versa, and examined variations across groups.

RESULTS: Significant differences were found in duration of gaze across groups. Lag sequential analysis found significant associations between several gaze patterns. Some, such as DGP-PGD (“doctor gaze patient” followed by “patient gaze doctor”) were significant for all groups. Others, such DGT-PGU (“doctor gaze technology” followed by “patient gaze unknown”) were unique to one group.

CONCLUSION: Some technology use styles (active information sharing) seem to create more patient engagement, while others (passive information sharing) lead to patient disengagement. Practice implications: Doctors can engage patients in communication by using EHRs in the visits. EHR training and design should facilitate this.


OBJECTIVES: This study aims to highlight the differences in physicians’ scores on two communication assessment tools: the SEGUE and an EMR-specific communication skills checklist. The first tool ignores the presence of the EMR in the exam room and the second, though not formally validated, rather focuses on it.
METHODS: We use the Wilcoxon Signed Ranks Test to compare physicians’ scores on each of the tools during 16 simulated medical encounters that were rated by two different raters.

RESULTS: Results show a significant difference between physicians’ scores on each tool (z = 3.519, p < 0.05 for the first rater, and z = 3.521, p < 0.05 for the second rater), while scores on the EMR-specific communication skills checklist were significantly and consistently lower.

CONCLUSION: These results imply that current communication assessment tools that do not incorporate items that are relevant for communication tasks during EMR use may produce inaccurate results. Practice implications: We therefore suggest that a new instrument, possibly an extension of existing ones, should be developed and empirically validated.


CompuHx* is an Interactive Health Appraisal System (IHAPS) used in the examining room at Kaiser-Permanente’s San Diego Department of Preventive Medicine to record patient information, assist in diagnosis, and provide a legible summary of findings. The purpose of the present project was to examine the impact of computer use in the examining room on patient satisfaction with the Health Appraisal experience. Survey results showed no significant differences in patient satisfaction between patients whose examiners used CompuHx and those whose examiners did not. These findings indicate that, in the eyes of the patients surveyed, clinician use of a computer in the examining room did not depersonalize their relationship with the clinician, nor did it enhance satisfaction with the thoroughness of the exam or confidence in the examiner’s findings.


BACKGROUND: Little has been written about physician stress that may be associated with electronic medical records (EMR).

OBJECTIVE: We assessed relationships between the number of EMR functions, primary care work conditions, and physician satisfaction, stress and burnout.

DESIGN AND PARTICIPANTS: 379 primary care physicians and 92 managers at 92 clinics from New York City and the upper Midwest participating in the 2001–5 Minimizing Error, Maximizing Outcome (MEMO) Study. A latent class analysis identified clusters of physicians within clinics with low, medium and high EMR functions.

MAIN MEASURES: We assessed physician-reported stress, burnout, satisfaction, and intent to leave the practice, and predictors including time pressure during visits. We used a two-level regression model to estimate the mean response for each physician cluster to each outcome, adjusting for physician age, sex, specialty, work hours and years using the EMR. Effect sizes (ES) of these relationships were considered small (0.14), moderate (0.39), and large (0.61).

KEY RESULTS: Compared to the low EMR cluster, physicians in the moderate EMR cluster reported more stress (ES 0.35, p=0.03) and lower satisfaction (ES -0.45, p=0.006). Physicians in the high EMR cluster indicated lower satisfaction than low EMR cluster physicians (ES -0.39, p=0.01). Time pressure was associated with significantly more burnout, dissatisfaction and intent to leave only within the high EMR cluster.

CONCLUSIONS: Stress may rise for physicians with a moderate number of EMR functions. Time pressure was associated with poor physician outcomes mainly in the high EMR cluster. Work redesign may address these stressors.


The electronic medical record (EMR) offers new avenues for inviting patients to become active partners in their health care. It also becomes a barrier to effective communication. Connected is a 3-hour on-site program designed to provide nurses and other clinicians with tools to help them communicate effectively with patients while using exam room computers. With effective communication, patients will experience the EMR as a valuable tool that enhances their confidence in care, encourages adherence to treatment regimens, and invites their active participation in their health care.

See also Reis S, Sagi D, Eisenberg O, et al: The impact of residents’ training in Electronic Medical Record (EMR) use on their competence.


The current literature does not provide an answer to the question, "What prompts patients to sue doctors or hospitals?" Not all adverse outcomes result in suits, and threatened suits do not always involve adverse outcomes. The exploration of other factors has been hampered by the lack of a methodology to contact plaintiffs and elicit their views about their experience in delivered health care. This study employed the transcripts of discovery depositions of plaintiffs as a source of insight into the issues that prompted individuals to file a malpractice claim.
METHODS: This study is a descriptive series review of a convenience sample of 45 plaintiffs’ depositions selected randomly from 67 depositions made available from settled malpractice suits filed between 1985 and 1987 against a large metropolitan medical center. Information extracted from each deposition included the alleged injury; the presence of the question, "Why are you suing?" and, if present, the answer; the presence of problematic relationship issues between providers and patients and/or families and, if present, the discourse supporting it; the presence of the question, "Did a health professional suggest maloccurrence?" and, if yes, who. Using a process of consensual validation, relationship issues were organized into groups of more generalized categories suggested by the data. Answers to the questions, "Why are you suing?" and "Who suggested maloccurrence?" are described.

RESULTS: Problematic relationship issues were identified in 71% of the depositions with an interrater reliability of 93.3%. Four themes emerged from the descriptive review of the 3787 pages of transcript: deserting the patient (32%), devaluing patient and/or family views (29%), delivering information poorly (26%), and failing to understand the patient and/or family perspective (13%). Thirty-one plaintiffs were asked if health professionals suggested maloccurrence. Fifty-four percent (n = 17) responded affirmatively. The postoutcome-consulting specialist was named in 71% (n = 12) of the depositions in which maloccurrence was allegedly suggested.

CONCLUSIONS: In our sample, the decision to litigate was often associated with a perceived lack of caring and/or collaboration in the delivery of health care. The issues identified included perceived unavailability, discounting patient and/or family concerns, poor delivery of information, and lack of understanding the patient and/or family perspective. Particular attention should be paid to the postadverse-event consultant-patient interaction.


Hospitals and physicians’ practices are rapidly implementing the electronic health record (EHR) because it offers many demonstrated advantages over paper records. Issues of misuse of the HER previously identified include breaches in confidentiality and privacy and inappropriate record sharing. I describe a separate set of ethical and quality problems of the EHR that result from its otherwise beneficial timesaving features that inadvertently enable carelessness and harmful shortcuts. These problems include copying and pasting data obtained from other clinicians, authorship ambiguities, inadvertent inclusion of unobtained data in templated notes, misleading history and physical examinations (“pseudohistory” and “pseudoevaluation”), failure to review prepopulated data, inadequate discharge summaries, impairments to patient–physician communication, and the transformation of the purpose of the medical record to billing documentation. I offer a brief analysis and recommendations to mitigate these problems.


BACKGROUND AND OBJECTIVES: There have been few reports on the effect of electronic health record (EHR) implementation as seen by those most responsible for using the system in a residency program. Our objective was to investigate how faculty, residents, and both clinical and nonclinical staff view the effects of EHR implementation on a broad range of issues.

METHODS: All 72 personnel were surveyed at 8 months (response rate 75%) and 12 months (response rate 57%) following full implementation of the EHR. The survey inquired into subjective perceptions of amount of time spent documenting and occurrence of documentation, effect on patient care, interference with other activities, effect on communication and relationships, coding/billing process, and overall efficiency.

RESULTS: Since EHR implementation, faculty and residents perceived documentation as taking 13 minutes per patient. It was seen as interfering with personal and educational time. Perception of all personnel was that the EHR was having a negative effect on patient care. There was no detectable statistically significant change between the 8- and 12-month surveys.

CONCLUSION: A perception of the promised improvement in patient care, provider communications, and billing efficiency due to EHR implementation was not realized in this population.

Boonstra A, Broekhuis M: Barriers to acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions. BMC Health Services Research. 2010;10:231.

BACKGROUND: The main objective of this research is to identify, categorize, and analyze barriers perceived by physicians to the adoption of Electronic Medical Records (EMRs) in order to provide implementers with beneficial intervention options.

METHODS: A systematic literature review, based on research papers from 1998 to 2009, concerning barriers to the acceptance of EMRs by physicians was conducted. Four databases, “Science”, “EBSCO”, “PubMed” and “The Cochrane Library”, were used in the literature search. Studies were included in the analysis if they reported on physicians’ perceived barriers to implementing and using electronic medical records. Electronic medical records are defined as computerized medical information systems that collect, store and display patient information.

RESULTS: The study includes twenty-two articles that have considered barriers to EMR as perceived by physicians. Eight main categories of barriers, including a total of 31 sub-categories, were identified. These eight categories are: A) Financial, B) Technical, C) Time, D) Psychological, E) Social, F) Legal, G) Organizational, and H) Change Process. All these categories are interrelated with each other. In particular, Categories G (Organizational) and H (Change Process) seem to be mediating factors
on other barriers. By adopting a change management perspective, we develop some barrier-related interventions that could overcome the identified barriers.

CONCLUSIONS: Despite the positive effects of EMR usage in medical practices, the adoption rate of such systems is still low and meets resistance from physicians. This systematic review reveals that physicians may face a range of barriers when they approach EMR implementation. We conclude that the process of EMR implementation should be treated as a change project, and led by implementers or change managers, in medical practices. The quality of change management plays an important role in the success of EMR implementation. The barriers and suggested interventions highlighted in this study are intended to act as a reference for implementers of Electronic Medical Records. A careful diagnosis of the specific situation is required before relevant interventions can be determined.

Callen JL, Bevis M, & McIntosh JH: (School of Health Information Management, Faculty of Health Sciences, The University of Sydney, Lidcombe, NSW 1825, Australia. j.callen@fhs.usyd.edu.au). Patients' perceptions of general practitioners using computers during the patient-doctor consultation. HIM J, 2005;34(1):8-12.

In this study 85 adult patients attending a Sydney general practice were asked for their views on computer-assisted consultations; 77 (91%) agreed to participate. In general, patients agreed they could still talk easily with their doctor, and felt listened to, while the doctor used the computer (87% & 75% respectively). More than half the patients felt the computer contributed to better treatment, although a quarter believed consultations were prolonged. About half the patients agreed that the doctor did not often explain the role of the computer. Given the national plans for increasing computerisation of health records (HealthConnect), this research suggests that more attention should be given to involving patients in e-health developments.


OBJECTIVE: To assess the impact of electronic health record (EHR) on healthcare quality, we hence carried out a systematic review and meta-analysis of published studies on this topic.

METHODS: PubMed, Web of Knowledge, Scopus and Cochrane Library databases were searched to identify studies that investigated the association between the EHR implementation and process or outcome indicators. Two reviewers screened identified citations and extracted data according to the PRISMA guidelines. Meta-analysis was performed using the random effects model for each indicator. Heterogeneity was quantified using the Cochran Q test and I² statistics, and publication bias was assessed using the Egger's test.

RESULTS: Of the 23 398 citations identified, 47 articles were included in the analysis. Meta-analysis showed an association between EHR use and a reduced documentation time with a difference in mean of -22.4% [95% confidence interval (CI) = -38.8 to -6.0%; P < 0.007]. EHR resulted also associated with a higher guideline adherence with a risk ratio (RR) of 1.33 (95% CI = 1.01 to 1.76; P = 0.049) and a lower number of medication errors with an overall RR of 0.46 (95% CI = 0.38 to 0.55; P < 0.001), and adverse drug effects (ADEs) with an overall RR of 0.66 (95% CI = 0.44 to 0.99; P = 0.045). No association with mortality was evident (P = 0.936). High heterogeneity among the studies was evident. Publication bias was not evident.

CONCLUSIONS: EHR system, when properly implemented, can improve the quality of healthcare, increasing time efficiency and guideline adherence and reducing medication errors and ADEs. Strategies for EHR implementation should be therefore recommended and promoted.


Electronic medical records (EMRs) and electronic health records (EHRs) have become an integral part of healthcare delivery in Canada. Implementing and using EMRs and EHRs (eRecords) can raise a number of technological issues and medico-legal risks. Physicians should learn about applicable legislation, regulatory requirements, technological standards, and software options. For advice and information, they might consider consulting with their colleagues, medical regulatory authority, provincial or territorial privacy commissioner (or the equivalent), and provincial or territorial medical association, and with the CMPA.


OBJECTIVES: To describe the patterns of computer use during patient visits to family doctors and to determine whether doctors alter their pattern of computer use in consultations which have significant psychological content.

DESIGN: Observational, non-randomised cluster trial with data being collected from videotaped consultations.

SETTING: Three inner-city Family Practice offices involved in physician training in Belfast, Northern Ireland.

Participants: Ten family doctors, who declared using computers during their consultations and consecutive consenting adult patients attending these doctors.

RESULTS: One hundred consultations were videotaped (59% patient participation rate). The average consultation time was 9 min 48 s, and number of problems per consultation was 1.9. Three broad styles of computer use were defined: (1) “end users”
who only used the computer at the end of a consultation to summarise the consultation, (2) “continuous users”, who interacted with the computer throughout the consultation, and (3) “minimal users”, who only ever used the computer at the end of the consultation mostly to issue prescriptions. Of the 100 consultations videoed 37% were of a psychological nature. Consultations with psychological content were on average longer (11 min 47 s vs. 8 min 39 s) and the average percentage time doctors spent on the computer was about half that of non-psychological consultations (11% vs. 23% and p < 0.001).

CONCLUSION: The doctors were found to adopt one of three broad styles of computer use during their consultations. In consultations with observable significant psychological content doctors significantly reduce the proportion of time at the computer suggesting an ability to appropriately tailor their use of the computer during consultations.


This is an excellent checklist with examples of effective communication while using an EHR.


BACKGROUND: Electronic health records have the potential to improve the delivery of health care services. However, in the United States, physicians have been slow to adopt such systems. This study assessed physicians’ adoption of outpatient electronic health records, their satisfaction with such systems, the perceived effect of the systems on the quality of care, and the perceived barriers to adoption.

METHODS: In late 2007 and early 2008, we conducted a national survey of 2758 physicians, which represented a response rate of 62%. Using a definition for electronic health records that was based on expert consensus, we determined the proportion of physicians who were using such records in an office setting and the relationship between adoption and the characteristics of individual physicians and their practices.

RESULTS: Four percent of physicians reported having an extensive, fully functional electronic-records system, and 13% reported having a basic system. In multivariate analyses, primary care physicians and those practicing in large groups, in hospitals or medical centers, and in the western region of the United States were more likely to use electronic health records. Physicians reported positive effects of these systems on several dimensions of quality of care and high levels of satisfaction. Financial barriers were viewed as having the greatest effect on decisions about the adoption of electronic health records.

CONCLUSIONS: Physicians who use electronic health records believe such systems improve the quality of care and are generally satisfied with the systems. However, as of early 2008, electronic systems had been adopted by only a small minority of U.S. physicians, who may differ from later adopters of these systems. 2008 Massachusetts Medical Society

See also letters to the editor responding to this article at New England Journal of Medicine. October 23 2008;359(17):1848-1849.


BACKGROUND AND OBJECTIVES: This study explored the views and perspectives of primary health care providers participating in the DELPHI (Deliver Primary Healthcare Information) project regarding their experiences using electronic medical records (EMRs) in their practices 2 years after adoption. This research was conducted in follow up to a previous qualitative study looking at early EMR implementation experiences.

METHODS: This descriptive qualitative study explored the experiences of 19 participants. Semi-structured interviews were conducted. Both individual and team analyses were performed.

RESULTS: Emergent from the data were five interwoven elements of team behavior when using the EMR. Consistent data entry was imperative to successful EMR utilization. The EMR software was utilized differently depending on the role of the team member. Team members continued to seek out a team champion/problem solver to help overcome obstacles. Communication was enhanced by using the common messaging system within the EMR. Finally, success with certain functions such as communication, champion enthusiasm, and recognition of the value of the EMR encouraged others to learn additional features and advanced the adoption process.

CONCLUSIONS: These findings illuminate important elements of team behavior that promoted EMR adoption and provide insight for primary health care providers moving through the continuum of initial to advanced EMR adoption.

BACKGROUND: Little information exists about what primary care physicians (PCPs) and patients experience if patients are invited to read their doctors’ office notes.

OBJECTIVE: To evaluate the effect on doctors and patients of facilitating patient access to visit notes over secure Internet portals.

DESIGN: Quasi-experimental trial of PCPs and patient volunteers in a year-long program that provided patients with electronic links to their doctors’ notes.

SETTING: Primary care practices at Beth Israel Deaconess Medical Center (BIDMC) in Massachusetts, Geisinger Health System (GHS) in Pennsylvania, and Harborview Medical Center (HMC) in Washington.

PARTICIPANTS: 105 PCPs and 13,564 of their patients who had at least 1 completed note available during the intervention period.

MEASUREMENTS: Portal use and electronic messaging by patients and surveys focusing on participants’ perceptions of behaviors, benefits, and negative consequences.

RESULTS: 11,797 of 13,564 patients with visit notes available opened at least 1 note (84% at BIDMC, 92% at GHS, and 47% at HMC). Of 5391 patients who opened at least 1 note and completed a postintervention survey, 77% to 87% across the 3 sites reported that open notes helped them feel more in control of their care; 60% to 78% of those taking medications reported increased medication adherence; 26% to 36% had privacy concerns; 1% to 8% reported that the notes caused confusion, worry, or offense; and 20% to 42% reported sharing notes with others. The volume of electronic messages from patients did not change. After the intervention, few doctors reported longer visits (0% to 5%) or more time addressing patients’ questions outside of visits (0% to 8%), with practice size having little effect; 3% to 36% of doctors reported changing documentation content; and 0% to 21% reported taking more time writing notes. Looking ahead, 59% to 62% of patients believed that they should be able to add comments to a doctor’s note. One out of 3 patients believed that they should be able to approve the notes’ contents, but 85% to 96% of doctors did not agree. At the end of the experimental period, 99% of patients wanted open notes to continue and no doctor elected to stop.

LIMITATIONS: Only 3 geographic areas were represented, and most participants were experienced in using portals. Doctors volunteering to participate and patients using portals and completing surveys may tend to offer favorable feedback, and the response rate of the patient surveys (41%) may further limit generalizability.

CONCLUSION: Patients accessed visit notes frequently, a large majority reported clinically relevant benefits and minimal concerns, and virtually all patients wanted the practice to continue. With doctors experiencing no more than a modest effect on their work lives, open notes seem worthy of widespread adoption.


Nurse practitioners are being asked to implement meaningful use initiatives including electronic personal health records (PHRs), yet little research has been done on the usability of the systems from a patient perspective. This qualitative study identified patient perceptions and barriers to the use of the PHR. Four themes were identified: access issues, perceived value of the PHR, potential usability, and security issues. Specific patient issues were those around the use of technology and health literacy issues. Nurse practitioners have an opportunity to work with patients and health information technology staff to address these issues and improve patient engagement through the use of PHRs.

PHRs were initially developed outside the health care system as Internet-based tools and typically initiated by the patient as a means for them to organize their health care data. More recently, the PHR has been linked or “tethered” to the EHR through Web portals, which allow information to cross over between the PHR and patients’ medical records. The tethered PHR can provide patients with preventative health care reminders, educational materials, and self-management resources, which have the potential to encourage patient engagement and may yield improvements in overall health.


This study examines New Zealand GPs’ interaction with computers in routine consultations. Twenty-eight video-recorded consultations from 10 GPs were analysed in micro-detail to explore: (i) how doctors divide their time and attention between computer and patient; (ii) the different roles ascribed to the computer; and (iii) how computer use influences the interactional flow of the consultation. All GPs engaged with the computer in some way for at least 20% of each consultation, and on average spent 12% of time totally focused on the computer. Patterns of use varied; most GPs inputted all or most notes during the consultation, but a few set aside dedicated time afterwards. The computer acted as an additional participant enacting roles like information repository and legitimiser of decisions. Computer use also altered some of the normal ‘rules of engagement’ between doctor and patient. Long silences and turning away interrupted the smooth flow of conversation, but various
'multitasking' strategies allowed GPs to remain engaged with patients during episodes of computer use (e.g. signposting, online commentary, verbalising while typing, social chat). Conclusions were that use of computers has many benefits but also significantly influences the fine detail of the GP consultation. Doctors must consciously develop strategies to manage this impact.


PURPOSE: We compared physicians’ self-reported attitudes and behaviours regarding electronic health record (EHR) use before and after installation of computers in patient examination rooms and transition to full implementation of an EHR in a family medicine training practice to identify anticipated and observed effects these changes would have on physicians’ practices and clinical encounters.

METHODS: We conducted two individual qualitative interviews with family physicians. The first interview was before and second interview was 8 months later after full implementation of an EHR and computer installation in the examination rooms. Data were analysed through project team discussions and subsequent coding with qualitative analysis software.

RESULTS: At the first interviews, physicians frequently expressed concerns about the potential negative effect of the EHR on quality of care and physician–patient interaction, adequacy of their skills in EHR use and privacy and confidentiality concerns. Nevertheless, most physicians also anticipated multiple benefits, including improved accessibility of patient data and online health information. In the second interviews, physicians reported that their concerns did not persist. Many anticipated benefits were realized, appearing to facilitate collaborative physician–patient relationships. Physicians reported a greater teaching role with patients and sharing online medical information and treatment plan decisions.

CONCLUSIONS: Before computer installation and full EHR implementation, physicians expressed concerns about the impact of computer use on patient care. After installation and implementation, however, many concerns were mitigated. Using computers in the examination rooms to document and access patients’ records along with online medical information and decision-making tools appears to contribute to improved physician–patient communication and collaboration.


Background: Implementation of the electronic health record (EHR) has changed the dynamics of doctor–patient communication. Physicians train to use EHRs from a technical standpoint, giving only minimal attention to integrating the human dimensions of the doctor–patient relationship into the computer-accompanied medical visit. Description: This article reviews the literature and proposes a model to help clinicians, residents, and students improve physician–patient communication while using the EHR.

Evaluation: We conducted a literature search on use of communication skills when interfacing with the EHR. We observed an instructional gap and developed a model using evidence-based communication skills. Conclusion: This model integrates patient-centered interview skills and aims to empower physicians to remain patient centered while effectively using EHRs. It may also serve as a template for future educational and practice interventions for use of the EHR in the examination room.


Kaiser Permanente, Northwest, evaluated the use of laptop computers to access our existing comprehensive Electronic Medical Record in exam rooms via a wireless radiofrequency (RF) network. Eleven of 22 clinicians who were offered the laptops successfully adopted their use in the exam room. These clinicians were able to increase their exam room time with the patient by almost 4 minutes (25%), apparently without lengthening their overall work day. Patient response to exam room computing was overwhelmingly positive. The RF network response time was similar to the hardwired network. Problems cited by some laptop users and many of the eleven non-adopters included battery issues, different equipment layout and function, and inadequate training. IT support needs for the RF laptops were two to four times greater than for hardwired desktops. Addressing the reliability and training issues should increase clinician acceptance, making a successful general roll-out for exam room computing more likely.


OBJECTIVE: To evaluate impact of exam-room computers on communication between clinicians and patients.

DESIGN AND METHODS: Longitudinal, qualitative study using videotapes of scheduled visits from 3 points in time: 1 month before, 1 month after, and 7 months after introduction of computers into the exam room.

SETTING: Primary care medical clinic in a large integrated delivery system.

PARTICIPANTS: Nine clinicians (6 physicians, 2 physician assistants, and 1 nurse practitioner) and 54 patients.
RESULTS: The introduction of computers into the exam room affected the visual, verbal, and postural connection between clinicians and patients. There were variations across the visits in the magnitude and direction of the computer’s effect. We identified 4 domains in which exam-room computing affected clinician-patient communication: visit organization, verbal and nonverbal behavior, computer navigation and mastery, and spatial organization of the exam room. We observed a range of facilitating and inhibiting effects on clinician-patient communication in all 4 domains. For 2 domains, visit organization and verbal and nonverbal behavior, facilitating and inhibiting behaviors observed prior to the introduction of the computer appeared to be amplified when exam-room computing occurred. Likewise, exam-room computing involving navigation and mastery skills and spatial organization of the exam-room created communication challenges and opportunities. In all 4 domains, little change was observed in exam-room computing behaviors from the point of intro. to 7-month follow-up.

CONCLUSIONS: Effective use of computers in the outpatient exam room may be dependent upon clinicians’ baseline skills that are carried forward and are amplified, positively or negatively, in their effects on clinician-patient communication. Computer use behaviors do not appear to change much over the first 7 months. Administrators and educators interested in improving exam-room computer use by clinicians need to better understand clinician skills and previous work habits associated with electronic medical records. More study of the effects of new technologies on the clinical relationship is also needed.


OBJECTIVE: Technical and interpersonal challenges of using electronic health records (EHRs) in ambulatory care persist. We use cockpit communication as an example of highly coordinated complex activity during flight and compare it with providers’ communication when computers are used in the exam room.

METHODS: Maximum variation sampling was used to identify two videotapes from a parent study of primary care physicians’ exam room computer demonstrating the greatest variation. We then produced and analyzed visualizations of the time providers spent looking at the computer and looking at the patient.

RESULTS: Unlike the cockpit which is engineered to optimize joint attention on complex coordinated activities, we found polar extremes in the use of joint focus of attention to manage the medical encounter.

CONCLUSION: We conclude that there is a great deal of room for improving the balance of interpersonal and technical attention that occurs in routine ambulatory visits in which computers are present in the exam room. Practice implications: Using well-known aviation practices can help primary care providers become more aware of the opportunities and challenges for enhancing the physician patient relationship in an era of exam room computing.


BACKGROUND: The general practice consultation today has become a three-way process where patient, doctor and computer interact. Some studies have shown that the introduction of the computer has caused concern to some patients, possibly affecting their behaviour. If patients are less frank about their problems in a computer-mediated consultation this may cause concerns among doctors and become a barrier to computer use.

OBJECTIVES: A questionnaire was developed to test the prevalence of worries among patients about confidentiality breaches of computer records and to identify whether those worries translated into a reduction in patients’ frankness.

RESULTS: The study had a 62% response rate. Almost 48% of responders had experienced confidentiality worries during past consultations. All responders denied withholding any relevant information from their general practitioner (GP) as a result of confidentiality worries. Gender, computer literacy, knowledge of computer uses in consultation and patients’ perceptions of computer record safety were selected covariates in the multivariate logistic regression model explaining patients’ worry. Thirty-three percent of patients stated they always understand what their GP is doing at the computer during consultation, 9.7% stated they did not ever know; though 64% judged it important to know what their GPs were doing.

CONCLUSIONS: Patients worry about the confidentiality of their computer record and it seems that those less familiar with computers, females and those less aware of their GP’s actions at the computer worry more. Patients’ understanding of their GPs’ actions at the computer during consultation is far from complete and they seem to place great importance on this. Those patients who place greatest importance on needing an understanding of their GP’s actions are those most likely to worry about confidentiality.


BACKGROUND AND OBJECTIVES: Trust and satisfaction in the physician-patient relationship is the cornerstone of family medicine. Today, computers are playing an increasingly prominent role in the delivery of health care, yet recent data detailing their effect on the physician-patient relationship are limited. For physicians to “first do no harm,” it is critical to determine that computers used at the point of care do not decrease patient satisfaction, because this is a good proxy for the physician-patient
relationship. This study assessed patients’ views of computer use and its effect on patient satisfaction in a family medicine clinic before and after implementation of an electronic environment developed by our institution.

METHODS: A survey was mailed to patients who had been evaluated at a family medicine clinic for hypertension, high blood pressure without hypertension, or hyperlipidemia. These diseases were selected because they are common and require strong physician-patient relationships for successful treatment. The survey assessed patients’ overall satisfaction with health care received at the clinic and their opinions about how their physician’s computer use affected their visit. This survey was compared with a survey done in 1995 at the same clinic, before adoption of the electronic environment.

RESULTS: A total of 478 patients were enrolled in the study; 304 (63.6%) of these returned surveys. A majority of the patients (74.6%) thought that the computer had an overall positive impact on the quality of care provided. There was a positive association between a physician’s computer skills, as rated by patients, and the patients’ satisfaction with the computer’s effect on the visit. There were no differences in overall satisfaction between the 1995 survey and the current survey.

CONCLUSIONS: This study shows that physician competence with computers plays an important role in patient satisfaction and that computers can be integrated into the office visit without a detrimental effect on patient satisfaction. Surprisingly, patient familiarity with computers was shown to have a slight negative correlation with patient satisfaction. These findings are significant in view of research indicating that compliance, health outcomes, perception of physician competence, and malpractice suits are all related to physicians’ interpersonal skills and patient satisfaction.


Use of medical scribes—unlicensed individuals hired to enter information into the EHR under clinician supervision—has increased substantially. Scribes reportedly enable physicians to see more patients; generate more revenue; and improve productivity, efficiency, accuracy of clinical documentation and billing, and patient satisfaction. ... [But] The use of scribes can pose potential risks to patients if they are allowed to enter orders into the EHR, and the risk of use creep is high. The medical scribe industry may impede the technological evolution of EHR products by undermining market demand for needed improvement, and it is unlikely that scribes will be used only as a temporary solution. The rise of the medical scribe industry should not be a substitute for much-needed EHR innovation and transition to more highly effective and more functionally efficient EHR systems.


General practice consultations were video-recorded before and after the introduction of a desk-top computer system into the practice. The recordings were analysed by detailed qualitative scrutiny of tape and transcripts (conversation analysis) to discover regular patterns of interaction. This analysis confirmed that the introduction of computers into the consultation had a significant impact on the communication between patient and doctor. In particular, we found that computer technology has had an impact on the practitioners’ conduct and on the disclosure of information by the patient. The analysis also points to some recommendations both for training general practitioners in the use of computerized systems in the consultation, and for the (re)design of the technologies themselves. Some examples of how the EHR affected the physician’s behavior:

1. Either remaining silent or restricting their contributions to minimal, largely undifferentiated responses as they typed and/or looked at the screen—even though a patient’s utterances may have invited a range of possible reactions such as assessments, advice, laughter, or expressions of sympathy or surprise.
2. Delaying their utterances until they had completed a sequence of keystrokes and/or checked something on the screen.
3. Pausing in the midst of their utterances as they attended to the computer in order to watch changes on the screen, complete sequences of keystrokes, or try to figure out what the system had done or required of them.
4. Confining their visual attention to the monitor and keyboard.
5. Glancing at patients while a screen change was in progress, but then immediately returning their gaze to the monitor when it was completed and/or a warning beep (indicating a possible error) sounded.
6. Abruptly shifting topic in order to elicit information that was required by the system.


To maximize disease control, patients must participate effectively in their medical care. The authors developed an intervention designed to increase the involvement of patients in medical decision making. In a 20-minute session just before the regular visit to a physician, a clinic assistant reviewed the medical record of each experimental patient with him/her, guided by a diabetes algorithm. Using systematic prompts, the assistant encouraged patients to use the information gained to negotiate medical decisions with the doctor. A randomized trial was conducted in two university hospital clinics to compare this intervention with standard educational materials in sessions of equal length. The mean pre-intervention glycosylated hemoglobin (HbA1) values were 10.6 +/- 2.1% for 33 experimental patients and 10.3 +/- 2.0% for 26 controls. After the intervention the mean levels were 9.1 +/- 1.9% in the experimental group (p 0.01) and 10.6 +/- 2.22% for controls. Analysis of audiotapes of the visits to the
physician showed the experimental patients were twice as effective as controls in eliciting information from the physician. Experimental patients reported significantly fewer function limitations. The authors conclude that the intervention is feasible and that it changes patient behavior, improves blood sugar control, and decreases functional limitations.


Patients and physicians enter the medical encounter with unique perspectives on the illness experience. These perspectives influence the way that information is shared during the initial phase of the interview. Previous research has demonstrated that patients who are able to fully share their perspective often achieve better outcomes. However, studies of patient-physician communication have shown that the patients’ perspective is often lost. Researchers and educators have responded with calls for practitioners to adopt a “narrative-based medicine” approach to the medical interview. In this article, we review the literature on narrative-based medicine with an emphasis on information sharing during the medical interview. We suggest a framework of skills and attitudes that can act as a foundation for future work in educating practitioners and researching the medical interview.

See also Platt FW: Two collaborating artists produce a work of art – the medical interview.


OBJECTIVE: We evaluate physician productivity using electronic medical records in a community hospital emergency department.

METHODS: Physician time usage per hour was observed and tabulated in the categories of direct patient contact, data and order entry, interaction with colleagues, and review of test results and old records.

RESULTS: The mean percentage of time spent on data entry was 43% (95% confidence interval, 39%-47%). The mean percentage of time spent in direct contact with patients was 28%. The pooled weighted average time allocations were 44% on data entry, 28% in direct patient care, 12% reviewing test results and records, 13% in discussion with colleagues, and 3% on other activities. Tabulation was made of the number of mouse clicks necessary for several common emergency department charting functions and for selected patient encounters. Total mouse clicks approach 4000 during a busy 10-hour shift.

CONCLUSION: Emergency department physicians spend significantly more time entering data into electronic medical records than on any other activity, including direct patient care. Improved efficiency in data entry would allow emergency physicians to devote more time to patient care, thus increasing hospital revenue.


OBJECTIVE: The aim of this study was to evaluate the impact of introducing health information technology (HIT) on physician-patient interactions during outpatient visits.

DESIGN: This was a longitudinal pre-post study: two months before and one and seven months after introduction of examination room computers. Patient questionnaires (n = 313) after primary care visits with physicians (n = 8) within an integrated delivery system. There were three patient satisfaction domains: (1) satisfaction with visit components, (2) comprehension of the visit, and (3) perceptions of the physician’s use of the computer.

RESULTS: Patients reported that physicians used computers in 82.3% of visits. Compared with baseline, overall patient satisfaction with visits increased seven months after the introduction of computers (odds ratio [OR] = 1.50; 95% confidence interval [CI]: 1.01-2.22), as did satisfaction with physicians’ familiarity with patients (OR = 1.60, 95% CI: 1.01-2.52), communication about medical issues (OR = 1.61; 95% CI: 1.05-2.47), and comprehension of decisions made during the visit (OR = 1.63; 95% CI: 1.06-2.50). In contrast, there were no significant changes in patient satisfaction with comprehension of self-care responsibilities, communication about psychosocial issues, or available visit time. Seven months post-introduction, patients were more likely to report that the computer helped the visit run in a more timely manner (OR = 1.76; 95% CI: 1.28-2.42) compared with the first month after introduction. There were no other significant changes in patient perceptions of the computer use over time.

CONCLUSION: The examination room computers appeared to have positive effects on physician-patient interactions related to medical communication without significant negative effects on other areas such as time available for patient concerns. Further study is needed to better understand HIT use during outpatient visits.

OBJECTIVE: The goal was to investigate the impact of a computer-based documentation tool on parent-health care provider communication during a pediatric health maintenance encounter.

METHODS: We used a quasieperimental study design to compare communication dynamics between clinicians and parents/children in health maintenance visits before and after implementation of the ClicTate system. Before ClicTate use, paper forms were used to create visit notes. The children examined were ≤/=18 months of age. All encounters were audiotaped or videotaped. A team of research assistants blinded to group assignment reviewed the audio portion of each encounter. Data from all recordings were analyzed, by using the Roter Interaction Analysis System, for differences in the open/closed question ratio, the extent of information provided by parents and providers, and other aspects of spoken and nonverbal communication (videotaped encounters).

RESULTS: Computer-based documentation visits were slightly longer than control visits (32 vs 27 minutes). With controlling for visit length, the amounts of conversation were similar during control and computer-based documentation visits. Computer-based documentation visits were associated with a greater proportion of open-ended questions (28% vs 21%), more use of partnership strategies, greater proportions of social and positive talk, and a more patient-centered interaction style but fewer orienting and transition phrases.

CONCLUSIONS: The introduction of ClicTate into the health maintenance encounter positively affected several aspects of parent-clinician communication in a pediatric clinic setting. These results support the integration of computer-based documentation into primary care pediatric visits.


Growing interest in the doctor-patient relationship focuses attention on the specific elements of that relationship that affect patients’ health outcomes. Data are presented for four clinical trials conducted in varied practice settings among chronically ill patients differing markedly in sociodemographic characteristics. These trials demonstrated that “better health” measured physiologically (blood pressure or blood sugar), behaviorally (functional status), or more subjectively (evaluations of overall health status) was consistently related to specific aspects of physician-patient communication. We conclude that the physician-patient relationship may be an important influence on patients’ health outcomes and must be taken into account in light of current changes in the health care delivery system that may place this relationship at risk. Key words: physician, interaction with patient; patient, interaction with physician; chronic disease; health outcomes; satisfaction, patient; compliance, patient.


BACKGROUND: High levels of funding have been invested in health information technologies, especially electronic health records (EHRs), in an effect to coordinate and organize patient health data. However, the effect of EHRs in the exam room on doctor–patient communication has not been sufficiently explored.

OBJECTIVE: The purpose of this systematic review was to determine how physician use of EHRs in medical consultations affects doctor–patient communication, both in terms of patient perceptions and actual physician behaviours.

METHOD: The reviewer conducted a comprehensive online database search in March 2013 of EMBASE, MEDLINE, and SCOPUS, using a combination of synonyms of the terms “patient”, “doctor”, “communication”, and “EHR” or “computing”. For inclusion in this review, articles had to be published in English, take place in an outpatient setting and demonstrate an empirical investigation into whether HER affects doctor–patient communication. The reviewer then analysed 13 articles that met the inclusion criteria.

RESULTS: Studies showed EHR use encouraged biomedical questioning of the patient, and encouraged patient-led questioning and doctor-led information provision. EHR-related behaviours such as keyboarding and screen gaze impaired relationships with patients, by reducing eye contact, rapport, and provision of emotional support. EHRs negatively affected physician-led patient-centred communication. Computer use may have amplified existing physician behaviours regarding medical record use.

CONCLUSION: We noted both positive and negative effects of EHR use. This review highlights the need for increased EHR-specific communication training to mitigate adverse effects and for continued acknowledgement of patient perspectives.


Nurses need to quickly process information to form clinical judgments, communicate with the healthcare team, and guide optimal patient care. Electronic health records not only offer potential for enhanced care but also introduce unintended consequences through changes in workflow, clinical judgment, and communication. We investigated nurses’ use of improvised (self-made) and electronic health record–generated cognitive artifacts on clinical judgment and team communication. Tanner’s
Clinical Judgment Model provided a framework and basis for questions in an online survey and focus group interviews. Findings indicated that (1) nurses rated self-made work lists and medication administration records highest for both clinical judgment and communication, (2) tools aided different dimensions of clinical judgment, and (3) interdisciplinary tools enhance team communication. Implications are that electronic health record tool redesign could better support nursing work.


BACKGROUND: Increased investments are being made for electronic medical records (EMRs) in Canada. There is a need to learn from earlier EMR studies on their impact on physician practice in office settings. To address this need, we conducted a systematic review to examine the impact of EMRs in the physician office, factors that influenced their success, and the lessons learned.

RESULTS: For this review we included publications cited in Medline and CINAHL between 2000 and 2009 on physician office EMRs. Studies were included if they evaluated the impact of EMR on physician practice in office settings. The Clinical Adoption Framework provided a conceptual scheme to make sense of the findings and allow for future comparison/alignment to other Canadian eHealth initiatives. In the final selection, we included 27 controlled and 16 descriptive studies. We examined six areas: prescribing support, disease management, clinical documentation, work practice, preventive care, and patient-physician interaction. Overall, 22/43 studies (51.2%) and 50/109 individual measures (45.9%) showed positive impacts, 18.6% studies and 18.3% measures had negative impacts, while the remaining had no effect. Forty-eight distinct factors were identified that influenced EMR success. Several lessons learned were repeated across studies: (a) having robust EMR features that support clinical use; (b) redesigning EMR-supported work practices for optimal fit; (c) demonstrating value for money; (d) having realistic expectations on implementation; and (e) engaging patients in the process.

CONCLUSIONS: Currently there is limited positive EMR impact in the physician office.


OBJECTIVE: To assess whether computer use by physicians during the patient-physician encounter influences patient satisfaction in a family medicine teaching centre.

DESIGN: Cross-sectional mailed survey.

SETTING: Queen’s University Family Medicine Centre in Kingston, Ont.

PARTICIPANTS: A random sample of 300 patients from the family medicine centre, all of whom were older than 18 years of age and had visited their family physicians in the past year.

MAIN OUTCOME MEASURES: Patient preference for or against computer use by the physician and effect of computer use on various aspects of patient-physician interaction.

RESULTS: The response rate was 58.3%. Most respondents (51.4%) had no preference about computer use in the office, and most (88.0%) were either “very satisfied” or “satisfied” with their visits. When assessing the influence of patient and visit characteristics on computer preference, only the “doctor’s attitude toward computer use” had a positive correlation with patient preference (P=.0012). Respondents were most likely to indicate “positive” or “very positive” effects of computer use on all aspects of the patient-physician interaction, except “level of distraction of the doctor” and “time spent chatting about nonmedical matters,” which were most commonly reported as being unaffected by computer use. Specifically, 57.1% of respondents thought that computer use had either a “positive” or “very positive” effect on their overall satisfaction with their visits, with another 30.3% believing there was no effect.

CONCLUSION: Most patients expressed no preference for whether or not computers were used in their physicians’ offices, although computers did seem to have a positive effect on overall satisfaction with visits. Doctors’ attitudes toward computer use influenced their patients’ preferences.


ABSTRACT: The effectiveness of electronic health record (EHR)-based clinical decision support is limited when clinicians do not interact with the EHR during patient visits. To assess EHR use during ambulatory visits and determine barriers to such use, we performed a cross-sectional survey of 501 primary care clinicians. Of 225 respondents, 53 (24%) never or only sometimes used any EHR functionality during patient visits. Non-physician clinicians (e.g., nurse practitioners) were marginally more likely to be EHR non-users than physicians (39% versus 21%, respectively; p = .05). The most commonly reported barriers to using the EHR during patient visits were loss of eye contact with patients (62%), falling behind schedule (52%), computers being too slow (49%), inability to type quickly enough (32%), feeling that using the computer in front of the patient is rude (31%), and preferring to write long prose notes (28%). EHR developers and healthcare system leaders must address social, workflow, technical, and professional barriers if clinicians are to use EHRs in the presence of patients and realize the full potential of ambulatory clinical decision support.
Linder JA, Ma J, Bates DW, Middleton B, Stafford RS: Electronic Health Record Use and the Quality of Ambulatory Care in the United States. Archives of Internal Medicine, 2007 July 9;167(13)1400-1405.

BACKGROUND: Electronic health records (EHRs) have been proposed as a sustainable solution for improving the quality of medical care. We assessed the association between EHR use, as implemented, and the quality of ambulatory care in a nationally representative survey.

METHODS: We performed a retrospective, cross-sectional analysis of visits in the 2003 and 2004 National Ambulatory Medical Care Survey. We examined EHR use throughout the United States and the association of EHR use with 17 ambulatory quality indicators. Performance on quality indicators was defined as the percentage of applicable visits in which patients received recommended care.

RESULTS: Electronic health records were used in 18% (95% confidence interval [CI], 15%-22%) of the estimated 1.8 billion ambulatory visits (95% CI, 1.7-2.0 billion) in the United States in 2003 and 2004. For 14 of the 17 quality indicators, there was no significant difference in performance between visits with vs without EHR use. Categories of these indicators included medical management of common diseases, recommended antibiotic prescribing, preventive counseling, screening tests, and avoiding potentially inappropriate medication prescribing in elderly patients. For 2 quality indicators, visits to medical practices using EHRs had significantly better performance: avoiding benzodiazepine use for patients with depression (91% vs 84%; P = .01) and avoiding routine urinalysis during general medical examinations (94% vs 91%; P = .003). For 1 quality indicator, visits to practices using EHRs had significantly worse quality: statin prescribing in pts. with hypercholesterolemia (33% vs 47%; P = .01).

CONCLUSION: As implemented, EHRs were not associated with better quality ambulatory care. Patients in the United States receive about half of recommended medical care, and there have been widespread calls to improve health care quality. Health information technology (HIT) and, in particular, electronic health records (EHRs) have been touted as cost-effective, sustainable solutions for improving quality in medical care. Although some computer- and EHR-based decision support efforts to improve quality have been successful, others have not. A recent systematic review conducted for the Agency for Healthcare Research and Quality found that HIT systems, including EHRs, can increase the delivery of guideline-adherent care, improve quality of care through clinical monitoring, and reduce rates of medical errors. However, much of the research supporting these findings in the United States comes from 4 "benchmark" institutions with largely internally developed EHR systems. Other settings using other systems may not have achieved these quality improvement benefits. We sought to determine whether the use of EHRs, as presently implemented, was associated with higher quality ambulatory care throughout the United States.


ABSTRACT: Worries about the security of personal information continue to blunt public acceptance of electronic health record (EHR) systems now used by more than half of the nation's office-based physicians, according to a survey conducted by Harris Interactive for Xerox.

Sixty-three percent of Americans fear that a computer hacker will steal their personal data, down just 1 percentage point from 2010. Not much else in public opinion has changed over the last 2 years. Roughly half of Americans still say that they are concerned that their digitized health data could be lost, damaged, or corrupted. And one half continue to worry that a power outage or computer crash could prevent a physician from accessing their chart.

Overall, the percentage of Americans with some kind of EHR anxiety rose from 83% to 85% over this time frame, according to the survey, which was published last month.

Americans also have some positive things to say about EHRs. Sixty-eight percent expect the technology to improve the quality of the treatment they receive, and 60% believe EHRs will reduce the overall cost of care. However, when it comes to the rubber-meets-the-road question of "I want my medical records to be digital," only 26% of Americans say "yes," down a percentage point from 2010. In terms of a global assessment, only 40% agree that digital records mean better, more efficient care. That was the same response in 2010.

The survey conducted by Harris Interactive for Xerox is just one snapshot of public opinion, and other surveys suggest that patients view EHRs with more enthusiasm. A Harris Poll published in February — this one for the National Partnership for
Women & Families — found that 75% of Americans whose medical records are paper ones want their physicians to digitize. Among those Americans whose physicians use EHRs, 73% say the software enhances the overall quality of service. However, even this otherwise positive survey uncovered a deep strain of EHR-phobia. Almost 60% of Americans with digital charts predict that widespread adoption of the technology will lead to more personal information being stolen or lost, according to the survey conducted for the National Partnership for Women & Families. This belief also was held by 66% of Americans still in the paper-chart world.

** Lown BA, Rodriguez D: Lost in translation? How electronic health records structure communication, relationships and meaning. Academic Medicine, 2012;87:392-394.  
The media through which we communicate shape how we think, how we act, and who we are. Electronic health records (EHRs) may promote more effective, efficient, coordinated, safer care. Research is emerging, but more is needed to assess the effect of EHRs on communication, relationships, patients’ trust, adherence, and health outcomes. The authors posit that EHRs introduce a “third party” into exam room interactions that competes with the patient for clinicians’ attention, affects clinicians’ capacity to be fully present, and alters the nature of communication, relationships, and physicians’ sense of professional role. Screen-driven communication inhibits patients’ narratives and diminishes clinicians’ responses to patients’ cues about psychosocial issues and emotional concerns. Students, trainees, and clinicians can, however, learn to integrate EHRs into triadic exam room interactions to facilitate information sharing and shared decision making. Student exposure to EHRs is currently limited. Educators and researchers should implement curricula and assessment tools to help learners integrate EHRs into clinical interactions in ways that foster, rather than diminish, communication and relationships. Further, educators must prioritize the teaching and modeling of self-awareness and self-calibration, mindful presence, and compassion within such curricula to prevent these important qualities and skills from being lost in translation in the digital era.

With the dawn of electronic medical records (EMRs) and patient portals, there is an unprecedented opportunity to provide truly collaborative patient-centred care. These tools can promote communication between healthcare providers and patients, improve chronic disease management and enable patients to become active members in the healthcare delivery system, but only if the tools work for everyone involved — including patients. Without patient consultation and input, there will be limitations in the ways in which physicians and patients are able to capitalize on these tools. Decision-makers must begin to enact their commitment to collaborative patient-centred care by engaging patients in discussions related to EMR design, implementation and use.

OBJECTIVE: To assess physician–patient communication patterns associated with use of an electronic medical record (EMR) system in an outpatient setting and provide an empirical foundation for larger studies.  
DESIGN: An exploratory, observational study involving analysis of videotaped physician–patient encounters, questionnaires, and medical-record reviews.  
SETTING: General internal medicine practice at an academic medical center.  
PARTICIPANTS: Three physicians who used an EMR system (EMR physicians) and three who used solely a paper record (control physicians). A total of 204 patient visits were included in the analysis (mean, 34 for each physician).  
MAIN OUTCOME MEASURES: Content analysis of whether physicians accomplished communication tasks during encounters; qualitative analysis of how EMR physicians used the EMR and how control physicians used the paper chart.  
RESULTS: Compared with the control physicians, EMR physicians adopted a more active role in clarifying information, encouraging questions, and ensuring completeness at the end of a visit. A trend suggested that EMR physicians might be less active than control physicians in three somewhat more patient-centered areas (outlining the patient’s agenda, exploring psychosocial/emotional issues, discussing how health problems affect a patient’s life). Physicians in both groups tended to direct their attention to the patient record during the initial portion of the encounter. The relatively fixed position of the computer limited the extent to which EMR physicians could physically orient themselves toward the patient. Although there was no statistically significant difference between the EMR and control physicians in terms of mean time across all visits, a difference did emerge for initial visits: Initial visits with EMR physicians took an average of 37.5 percent longer than those with control physicians.  
SUMMARY: An EMR system may enhance the ability of physicians to complete information intensive tasks but can make it more difficult to focus attention on other aspects of patient communication. Further study involving a controlled, pre-/post-intervention design is justified.
OBJECTIVES: Within the context of medical care there is no greater reflection of the information revolution than the electronic medical record (EMR). Current estimates suggest that EMR use by Israeli physicians is now so high as to represent an almost fully immersed environment. This study examines the relationships between the extent of electronic medical record use and physician–patient communication within the context of Israeli primary care.

METHODS: Based on videotapes of 3 Israeli primary care physicians and 30 of their patients, the extent of computer use was measured as number of seconds gazing at the computer screen and 3 levels of active keyboarding. Communication dynamics were analyzed through the application of a new Hebrew translation and adaptation of the Roter Interaction Analysis System (RIAS).

RESULTS: Physicians spent close to one-quarter of visit time gazing at the computer screen, and in some cases as much as 42%; heavy keyboarding throughout the visit was evident in 24% of studied visits. Screen gaze and levels of keyboarding were both positively correlated with length of visit (r = .51, p < .001 and F(2,27) = 2.83, p < .08, respectively); however, keyboarding was inversely related to the amount of visit dialogue contributed by the physician (F(2,27) = 4.22, p < .02) or the patient (F(2,27) = 3.85, p < .05). Specific effects of screen gaze were inhibition of physician engagement in psychosocial question asking (r = -.39, p < .02) and emotional responsiveness (r = -.30, p < .10), while keyboarding increased biomedical exchange, including more questions about therapeutic regimen (F(2,27) = 4.78, p < .02) and more patient education and counseling (F(2,27) = 10.38, p < .001), as well as increased patient disclosure of medical information to the physician (F(2,27) = 3.40, p < .05). A summary score reflecting overall patient-centered communication during the visit was negatively correlated with both screen gaze and keyboarding (r = -.33, p < .08 and F(2,27) = 3.19, p < .06, respectively).

DISCUSSION: The computer has become a ‘third party’ in the visit that demanded a significant portion of visit time. Gazing at the monitor was inversely related to physician engagement in psychosocial questioning and emotional responsiveness and to patient limited socio-emotional and psychosocial exchange during the visit. Keyboarding activity was inversely related to both physician and patient contribution to the medical dialogue. Patients may regard physicians’ engrossment in the tasks of computing as disinterested or disengaged. Increase in visit length associated with EMR use may be attributed to keyboarding and computer gazing.

CONCLUSIONS: This study suggests that the way in which physicians use computers in the examination room can negatively affect patient centered practice by diminishing dialogue, particularly in the psychosocial and emotional realm. Screen gaze appears particularly disruptive to psychosocial inquiry and emotional responsiveness, suggesting that visual attentiveness to the monitor rather than eye contact with the patient may inhibit sensitive or full patient disclosure.

PRACTICAL IMPLICATIONS: We believe that training can help physicians optimize interpersonal and educationally effective use of the EMR. This training can assist physicians in overcoming the interpersonal distancing, both verbally and non-verbally, with which computer use is associated. Collaborative reading of the EMR can contribute to improved quality of care, enhance the decision-making process, and empower patients to participate in their own care.

McGrath JM, Arar NH, Pugh JA: Health (Department of Communication, Trinity University, One Trinity Place San Antonio, TX 78212, USA. jmccgrath@trinity.edu). The influence of electronic medical record usage on nonverbal communication in the medical interview. Informatics J, 2007 Jun;13(2):105-18.

This study examined nonverbal communication in relation to electronic medical record (EMR) use during the medical interview. Six physicians were videotaped during their consultations with 50 different patients at a single setting Veterans Administration Hospital. Three different office spatial designs were identified and named ‘open,’ ‘closed’ and ‘blocked’. The ‘open’ arrangement put physicians in a position to establish better eye contact and physical orientation than did the alternative ‘closed’ and ‘blocked’ office configurations. Physicians who accessed the EMR and took ‘breakpoints’ (short periods of no computer use and sustained eye contact with patients) used more nonverbal cues than physicians who tended to talk with their patients while continuously working on the computer. Long pauses in conversational turn taking associated with EMR use may have positively influenced doctor-patient communication. High EMR use interviews were associated with patients asking more questions than they did in low EMR use interviews. Implications for medical education and future research are discussed.


The United States healthcare system is highly inefficient, with high costs and suboptimal quality. Electronic Health Records (EHRs) can help address the dual problems of high costs and poor quality in health care by improving communication between providers and health care facilities, decreasing errors, preventing duplicate test ordering, standardizing care by improving adherence to guidelines and engaging patients in managing their own health. Unfortunately, in spite of their promise, thus far, EHRs have failed to lead to significant improvements in outcomes in patient care. EHRs are multi-author documents, with contributions from multiple providers collaborating on the care of a patient. Presently, a patent’s EHR consists of independent notes, with a new note created at each point of contact with the patient, rather than a shared, continually updated, well-organized summary of the patient record. To get a full perspective of the relevant health issues, providers must review all of
Electronic health records continue to make physicians' lives more complicated. Through the EHR, physicians are being asked to take on ever more tasks that were previously done by office staff or are totally new to medical practice. Physicians maintain coded lists of diagnoses, medications, and allergies; enter orders; initiate referrals; fill out billing forms; fulfill quality reporting requirements; and do population management. With the Medicare and Medicaid EHR Incentive Program, better known as “meaningful use,” physicians are required to do even more. Stage 2 of meaningful use requires physicians to maintain searchable notes, use clinical decision support, generate lists of patients for quality improvement and reporting, communicate electronically with other providers, exchange summary care records, and perform surveillance or public health reporting. ... Whether easier or not, EHRs will enable physicians to do more for their patients. Changes in EHRs, healthcare financing, and medical culture are going to continue interacting in complex ways. We will endure—perhaps even welcome—this complexity, and continually demand the best from our technology, financing, and culture by staying focused on delivering patient care that is of increasing value, safety, and quality.


OBJECTIVE: The aim of this study was to examine eye gaze patterns between patients and physicians while electronic health records were used to support patient care.

BACKGROUND: Eye gaze provides an indication of physician attention to patient, patient/physician interaction, and physician behaviors such as searching for information and documenting information.

METHODS: A field study was conducted where 100 patient visits were observed and video recorded in a primary care clinic. Videos were then coded for gaze behaviors where patients’ and physicians’ gaze at each other and artifacts such as electronic health records were coded using a pre-established objective coding scheme. Gaze data were then analyzed using lag sequential methods.

RESULTS: Results showed that there are several eye gaze patterns significantly dependent to each other. All doctor-initiated gaze patterns were followed by patient gaze patterns. Some patient-initiated gaze patterns were also followed by doctor gaze patterns significantly unlike the findings in previous studies. Health information technology appears to contribute to some of the new significant patterns that have emerged. Differences were also found in gaze patterns related to technology that differ from patterns identified in studies with paper charts. Several sequences related to patient–doctor–technology were also significant. Electronic health records affect the patient–physician eye contact dynamic differently than paper charts.

CONCLUSION: This study identified several patterns of patient–physician interaction with electronic health record systems. Consistent with previous studies, physician initiated gaze is an important driver of the interactions between patient and physician and patient and technology.


BACKGROUND AND OBJECTIVES: Graduating medical students will universally use electronic health records (EHRs), yet a June 2007 literature search revealed no descriptions of EHR-specific communication skills curricula in US medical schools. We designed and tested methods to teach first-year medical students to optimally integrate EHRs into physician-patient communication in ambulatory encounters.

METHODS: We randomly assigned 17 volunteer students to control (n=8) and intervention (n=9) groups. Both groups learned the mechanics of documenting patient histories using the EHR. Additionally, we taught the intervention group EHR-specific communications skills using guided discovery, brief didactics, and practice role plays. We compared both groups’ general and EHR-specific communications skills using a standardized patient (sp) case.

RESULTS: Students receiving EHR communication skills training performed significantly better than controls in six of 10 EHR communication skills. In 10 of 11 general communication skills, there were no significant differences between groups.
CONCLUSIONS: First-year medical students can demonstrate EHR communication skills early in their medical training. However, in our setting, students did not spontaneously demonstrate EHR skills without instruction, and such skills did not correlate with general communication skills.


BACKGROUND: Processes of communication that guide decision making among clinicians collaboratively caring for complex patients are poorly understood and vary based on local contexts. In this paper, the authors characterize these processes and propose a wiki-style communication model to improve coordination of decision making among clinicians using an integrated electronic health record (EHR).

METHODS: A narrative review of current patterns of communication among clinicians sharing medical decisions focusing on the emerging and potential roles of EHRs to enhance communication among clinicians caring for complex patients.

RESULTS: The authors present the taxonomy of decision making and communication among clinicians caring for complex patients. They then adapt wiki-style communication to propose a novel model of communication among clinicians for decision making within multidisciplinary disease management programs. Future innovations using wiki-style communication among clinicians are also described and placed in the context of medical decisions by clinicians working together in disease management programs.

CONCLUSIONS: EHR-based wiki-style applications may have the potential to improve communication and care coordination among clinicians caring for complex patients. This could lead to improved quality and safety within multidisciplinary disease management programs.

See also the article by Mehta, Vakharia & Wright on Wiki-like Problem Lists.


BACKGROUND: In the western medical world, computers form part of the standard equipment in the consulting rooms of most GPs. As the use of a computer requires time and attention from GPs, this may well interfere with the communication process. Yet, the information accessed on the computer may also enhance communication.

OBJECTIVES: The present study affords insight into the relationship between computer use and GP–patient communication recorded by the same GPs over two periods.

METHOD: Videotaped GP consultations collected in 2001 and 2008 were used to observe computer use and GP–patient communication. In addition, patients questionnaires about their experiences with communication by the GP were analysed using multilevel models with patients (Level 1) nested within GPs (Level 2).

RESULTS: Both in 2008 and in 2001, GPs used their computer in almost every consultation. Still, our study showed a change in computer use by the GPs over time. In addition, the results indicate that computer use is negatively related to some communication aspects: the patient-directed gaze of the GP and the amount of information given by GPs. There is also a negative association between computer use and the body posture of the GP. Computer use by GPs is not associated with other (analysed) non-verbal and verbal behaviour of GPs and patients. Moreover, computer use is scarcely related to patients’ experiences with the communication behaviour of the GP.

CONCLUSIONS: GPs show greater reluctance to use computers in 2008 compared to 2001. Computer use can indeed affect the communication between GPs and patients. Therefore, GPs ought to remain aware of their computer use during consultations and at the same time keep the interaction with the patient alive.


PURPOSE: We wanted to assess the impact of an electronic health record–based diabetes clinical decision support system on control of hemoglobin A1c (glycated hemoglobin), blood pressure, and low-density lipoprotein (LDL) cholesterol levels in adults with diabetes.

METHODS: We conducted a clinic-randomized trial conducted from October 2006 to May 2007 in Minnesota. Included were 11 clinics with 41 consenting primary care physicians and the physicians’ 2,556 patients with diabetes. Patients were randomized either to receive or not to receive an electronic health record (EHR)–based clinical decision support system designed to improve care for those patients whose hemoglobin A1c, blood pressure, or LDL cholesterol levels were higher than goal at any office visit. Analysis used general and generalized linear mixed models with repeated time measurements to accommodate the nested data structure.

RESULTS: The intervention group physicians used the EHR-based decision support system at 62.6% of all office visits made by adults with diabetes. The intervention group diabetes patients had significantly better hemoglobin A1c (intervention effect − 0.26%; 95% confidence interval, −0.06% to −0.47%; P = .01), and better maintenance of systolic blood pressure control (80.2% vs 75.1%, P = .03) and borderline better maintenance of diastolic blood pressure control (85.6% vs 81.7%, P = .07), but not
improved low-density lipoprotein cholesterol levels (P = .62) than patients of physicians randomized to the control arm of the study. Among intervention group physicians, 94% were satisfied or very satisfied with the intervention, and moderate use of the support system persisted for more than 1 year after feedback and incentives to encourage its use were discontinued.

CONCLUSIONS: EHR-based diabetes clinical decision support significantly improved glucose control and some aspects of blood pressure control in adults with type 2 diabetes.


OBJECTIVE: The aim of this paper is to examine knowledge organization and reasoning strategies involved in physician–patient communication and to consider how these are affected by the use of computer tools, in particular, electronic medical record (EMR) systems.

DESIGN: In the first part of the paper, we summarize results from a study in which patients were interviewed before their interactions with physicians and where physician–patient interactions were recorded and analyzed to evaluate patients’ and physicians’ understanding of the patient problem. We give a detailed presentation of one of such interaction, with characterizations of physician and patient models. In a second set of studies, the contents of both paper and EMRs were compared and in addition, physician–patient interactions (involving the use of EMR technology) were video recorded and analyzed to assess physicians’ information gathering and knowledge organization for medical decision-making.

RESULTS: Physicians explained the patient problems in terms of causal pathophysiological knowledge underlying the disease (disease model), whereas patients explained them in terms of narrative structures of illness (Illness model). The data-driven nature of the traditional physician–patient interaction allows physicians to capture the temporal flow of events and to document key aspects of the patients’ narratives. Use of electronic medical records was found to influence the way patient data were gathered, resulting in information loss and disruption of temporal sequence of events in assessing patient problem.

CONCLUSIONS: The physician–patient interview allows physicians to capture crucial aspects of the patient’s illness model, which are necessary for understanding the problem from the patients’ perspective. Use of computer-based patient record technology may lead to a loss of this relevant information. As a consequence, designers of such systems should take into account information relevant to the patient comprehension of medical problems, which will influence their compliance.


This on-line debate began as an essay spontaneously submitted by Peled and Sagher, which underwent peer review. PLoS Medicine then invited Morrow and Dobbie to participate in the debate, and their contribution was not peer reviewed.

Medical schools and teaching hospitals sit today at an important crossroads. In the United States, the federal government and many third-party payors are demanding that we modernize medical-information systems and have given us an ambitious schedule to do so. Eager to comply with these mandates and anxious to avoid financial penalties, hospitals are implementing EHR systems on a large scale. The effects of this implementation on patient care have not been uniformly positive, and a number of reports of risk have already been published. Our experiences have led us to believe that the potential risk of EHRs to medical teaching may be just as significant and, if not addressed, could erode the education of an entire generation of physicians. On the other hand, if the EHR is used as a tool rather than an end unto itself, it will improve our education of young physicians as well as the care of our patients.


BACKGROUND: Computers are now commonplace in the general practice consultation in many countries and literature is beginning to appear that describes the effects of this presence on the doctor–patient relationship. Concepts such as patient centeredness emphasize the importance of this relationship to patient outcomes, yet the presence of the computer has introduced another partner to that relationship.

OBJECTIVE: To describe the patient–doctor–computer relationship during the opening period of the consultation.

METHODS: Twenty GPs provided 141 consultations for direct observation, using digital video. Consultations were analysed according to Goffman’s dramaturgical methodology.

RESULTS: Openings could be described as doctor, patient or computer openings, according to the source of initial influence on the consultation. Specific behaviours can be described within those three categories.

CONCLUSIONS: The presence of the computer has changed the beginning of the consultation. Where once only two actors needed to perform their roles, now three interact in differing ways. Information comes from many sources, and behaviour responds accordingly. Future studies of the consultation need to take into account the impact of the computer in shaping how the consultation flows and the information needs of all participants.
An implication of the phrase “taking a history” is that the doctor is performing an act of extraction similar to a dentist’s removing a tooth. Indeed, the process is often as brutal as it sounds, an assault of closed-ended questions punctuated briefly by faint yes and no answers from the patient, who becomes alienated, uncooperative, and dissatisfied as the process continues…While “taking a history” implies an aggressor acting on a victim, a taker, and a taken—from, “building” one allows for a joint effort between the doctor and the patient.

See also Haidet P, Paterniti DA: “Building” a history rather than “taking” one.


The use of an outpatient electronic health record (EHR) system, rolled out across 17 medical centers, was associated with improvements in clinical outcomes and health care utilization in a study population of nearly 170,000 people with diabetes. Mary Reed, DrPH, a researcher at Kaiser Permanente Northern California in Oakland, and her colleagues found improvements in multiple clinical measures after EHR implementation, particularly among patients with less well-controlled glucose and lipid levels.

"[W]e found that EHR use was associated with improved rates of medication treatment intensification, follow-up monitoring, and glycemic and lipid control in patients with diabetes," the authors write in the October 2 issue of Annals of Internal Medicine.

This is the first study of a large outpatient diabetic population to assess the effect of a complete and certified EHR system. The federal government has established financial incentives, totaling $29 billion, to encourage EHR uptake and "meaningful use," yet little longitudinal data are available regarding the clinical value of EHRs, according to the authors.

The researchers identified 169,711 patients in the Kaiser Permanente diabetes registry at the end of 2003. As Kaiser rolled out a commercially available EHR system (EpicCare, Epic Systems) between 2004 and 2009, 129,433 patients had 972,115 hemoglobin A1c (HbA1c) tests and another 151,838 had 1,095,991 low-density lipoprotein (LDL) cholesterol assays.

The EHR system was associated with treatment intensification among patients with elevated HbA1c levels. Participants with levels of 9% or greater experienced an increase in treatment intensification associated with EHR use (odds ratio [OR], 1.10 [95% confidence interval (CI), 1.05-1.15]), as did those with values of 7% to 8.9% (OR, 1.12 [CI, 1.06-1.18]). Both findings were statistically significant (P < .001) in a multivariate analysis adjusting for calendar month, year, medical center, and patient characteristics. In contrast, the researchers saw no change among patients with HbA1c values below 7% (OR, 0.98 [CI, 0.94-1.02]; P = .29).

EHR implementation was also associated with statistically significant treatment intensification for patients with LDL cholesterol values between 100 and 129 mg/dL (OR, 1.06 [CI, 1.00 to 1.12]; P = .036). However, there was no statistically significant change associated with EHR implementation among patients with LDL cholesterol values of 130 mg/dL or greater (OR, 0.97 [CI, 0.91 to 1.04]; P = .46). There was a statistically significant reduced likelihood of treatment intensification in patients with cholesterol values of 100 mg/dL or lower (OR, 0.88 [CI, 0.82 to 0.94]).

Three additional clinical benefits were associated with EHR implementation in multivariate analyses. A statistically increased likelihood of patients having a follow-up test within 1 year was observed for all patients (P < .050). At the same time, patients with an index test indicating good control were less likely to undergo retesting within 90 days (P < .005), potentially signaling more appropriate use of resources. In contrast, for patients with elevated HbA1c or LDL cholesterol levels, the EHR was associated with a faster rate of retesting overall (P < .001), compared with a period before EHR adoption.

"Overall, our study suggests that the EHR may be a powerful tool to help clinicians deliver well-targeted, high-quality chronic disease care and improve patient outcomes," the authors write.

The National Institute of Diabetes and Digestive and Kidney Diseases funded the study. One coauthor reports having served as a consultant for a project sponsored by the Agency for Healthcare Research and Quality. Another coauthor reports receiving consulting fees, honoraria, or other nongrant funds from the National Institute of Diabetes and Digestive and Kidney Diseases.


OBJECTIVES: Even though Electronic Medical Records (EMRs) are increasingly used in healthcare organizations there is surprisingly little theoretical work or educational programs in this field. This study is aimed at comparing two training programs for doctor–patient–computer communication (DPCC).

METHODS: 36 Family Medicine Residents (FMRs) participated in this study. All FMRs went through twelve identical simulated encounters, six pre and six post training. The experiment group received simulation based training (SBT) while the control group received traditional lecture based training. Results: Performance, attitude and sense of competence of all FMRs improved, but no difference was found between the experiment and control groups. FMRs from the experiment group evaluated the contribution of the training phase higher than control group, and showed higher satisfaction.
CONCLUSION: We assume that the mere exposure to simulation served as a learning experience and enabled deliberate practice that was more powerful than training. Because DPCC is a new field, all participants in such studies, including instructors and raters, should receive basic training of DPCC skills. Practice implication: Simulation enhances DPCC skills. Future studies of this kind should control the exposure to simulation prior to the training phase. Training and assessment of clinical communication should include EMR related skills.

See also Baker LH, Reifsteck SW, & Mann WR. Connected: communication skills for nurses using the electronic medical record.


ABSTRACT: Ten months after the installation of a computer in a general practice surgery a postal survey (piloted questionnaire) was sent to 390 patients. The patients’ views of their relationship with their doctor after the computer was introduced were compared with their view of their relationship before the installation of the computer. More than 96% of the patients (n=263) stated that contact with their doctor was as easy and as personal as before. Most stated that the computer did not influence the duration of the consultation. Eighty one patients (30%) stated, however, that they thought that their privacy was reduced.

Unlike studies of patients’ attitudes performed before any actual experience of use of a computer in general practice, this study found that patients have little difficulty in accepting the presence of a computer in the consultation room. Nevertheless, doctors should inform their patients about any connections between their computer and other, external computers to allay fears about a decrease in privacy.


BACKGROUND: Patients and physicians value effective communication and consider it an essential part of the medical encounter. This study examined physician-patient communication patterns, and interruptions in communication, during patient visits with family practice and internal medicine residents.

METHODS: Observational data obtained from 60 routine primary care office visits included the time that resident physicians and patients spoke and the number and types of interruptions. A total of 22 family practice and internal medicine residents participated, 9 from family practice and 13 from internal medicine.

RESULTS: Patients spoke, uninterrupted, an average of 12 seconds after the resident entered the room. One fourth of the time, residents interrupted patients before they finished speaking. Residents averaged interrupting patients twice during a visit. The time with patients averaged 11 minutes, with the patient speaking for about 4 minutes. Computer use during the office visit accounted for more interruptions than beepers. Verbal interruptions, a knock on the door, beeper interruptions, and computer use all interfered with communication, and increased frequency of interruptions are associated with less favorable patient perceptions of the office visit. Female residents interrupted their patients less often than did male physicians. All residents interrupted female patients more often than male patients. Early and increased interruptions were associated with patients’ perception that they should have talked more. Third-year residents interrupted patients less frequently than did first-year residents.

CONCLUSIONS: Numerous interruptions occurred during office visits. Gender was associated with the pattern of interruptions. Physicians frequently interrupted patients before the patients were finished speaking. Computer use also interrupted physician-patient communication.


BACKGROUND: United States academic medical centers are increasingly incorporating electronic health records (EHR) into teaching settings. We report third year medical students’ attitudes towards clinical learning using the electronic health record in ambulatory primary care clinics.

METHODS: In academic year 2005–06, 60 third year students were invited to complete a questionnaire after finishing the required Ambulatory Medicine/Family Medicine clerkship. The authors elicited themes for the questionnaire by asking a focus group of third year students how using the EHR had impacted their learning. Five themes emerged: organization of information, access to online resources, prompts from the EHR, personal performance (charting and presenting), and communication with patients and preceptors. The authors added a sixth theme: impact on student and patient follow-up. The authors created a 21-item questionnaire, based on these themes that used a 5-point Likert scale from “Strongly Agree” to “Strongly Disagree”. The authors emailed an electronic survey link to each consenting student immediately following their clerkship experience in Ambulatory Medicine/Family Medicine.

RESULTS: 33 of 53 consenting students (62%) returned completed questionnaires. Most students liked the EHR’s ability to organize information, with 70% of students responding that essential information was easier to find electronically. Only 36%
and 33% of students reported accessing online patient information or clinical guidelines more often when using the EHR than when using paper charts. Most students (72%) reported asking more history questions due to EHR prompts, and 39% ordered more clinical preventive services. Most students (69%) reported that the EHR improved their documentation. 39% of students responded that they received more feedback on their EHR notes compared to paper chart notes. Only 64% of students were satisfied with the doctor-patient communication with the EHR, and 48% stated they spent less time looking at the patient.

CONCLUSION: Third year medical students reported generally positive attitudes towards using the EHR in the ambulatory setting. They reported receiving more feedback on their electronic charts than on paper charts. However, students reported significant concerns about the potential impact of the EHR on their ability to conduct the doctor-patient encounter.


BACKGROUND: The use of electronic medical records can improve the technical quality of care, but requires a computer in the exam room. This could adversely affect interpersonal aspects of care, particularly when physicians are inexperienced users of exam room computers.

OBJECTIVE: To determine whether physician experience modifies the impact of exam room computers on the physician-patient interaction.

DESIGN: Cross-sectional surveys of patients and physicians.

SETTING AND PARTICIPANTS: One hundred fifty five adults seen for scheduled visits by 11 faculty internists and 12 internal medicine residents in a VA primary care clinic.

MEASUREMENTS: Physician and patient assessment of the effect of the computer on the clinical encounter.

MAIN RESULTS: Patients seeing residents, compared to those seeing faculty, were more likely to agree that the computer adversely affected the amount of time the physician spent talking to (34% vs 15%, P = 0.01), looking at (45% vs 24%, P = 0.02), and examining them (32% vs 13%, P = 0.009). Moreover, they were more likely to agree that the computer made the visit feel less personal (20% vs 5%, P = 0.017). Few patients thought the computer interfered with their relationship with their physicians (8% vs 8%). Residents were more likely than faculty to report these same adverse effects, but these differences were smaller and not statistically significant.

CONCLUSION: Patients seen by residents more often agreed that exam room computers decreased the amount of interpersonal contact. More research is needed to elucidate key tasks and behaviors that facilitate doctor-patient communication in such a setting.


This article studies the coordination of patients' production of their primary complaint and doctors' orientation to the patient on the one hand and to medical records on the other. In specific environments the doctor's shift of focus from interaction with the patient towards reading or writing the medical records is received by the patients as problematic. It is suggested that disengaging from interaction and engaging in studying the medical records may leave the patient puzzled about whether the doctor is listening or not. Thus, paying attention to the coordination and timing of these shifts in orientation may help the doctors to develop more patient-centered ways of interacting with the patient. Furthermore, studying the coordination of verbal and non-verbal aspects in medical interaction may complement the current ideas on the constituents of the ideal model of 'patient-centeredness' in medical interaction.


OBJECTIVE: To describe physicians' patterns of using an Electronic Medical Record (EMR) system; to reveal the underlying cognitive elements involved in EMR use, possible resulting errors, and influences on patient–doctor communication; to gain insight into the role of expertise in incorporating EMRs into clinical practice in general and communicative behavior in particular.

DESIGN: Cognitive task analysis using semi-structured interviews and field observations.

PARTICIPANTS: Twenty-five primary care physicians from the northern district of the largest health maintenance organization (HMO) in Israel.

RESULTS: The comprehensiveness, organization, and readability of data in the EMR system reduced physicians' need to recall information from memory and the difficulty of reading handwriting. Physicians perceived EMR use as reducing the cognitive load associated with clinical tasks. Automaticity of EMR use contributed to efficiency, but sometimes resulted in errors, such as the selection of incorrect medication or the input of data into the wrong patient’s chart. EMR use interfered with patient–doctor communication. The main strategy for overcoming this problem involved separating EMR use from time spent communicating with patients. Computer mastery and enhanced physicians' communication skills also helped.
CONCLUSIONS: There is a fine balance between the benefits and risks of EMR use. Automaticity, especially in combination with interruptions, emerged as the main cognitive factor contributing to errors. EMR use had a negative influence on communication, a problem that can be partially addressed by improving the spatial organization of physicians’ offices and by enhancing physicians’ computer and communication skills.


This paper provides an excellent review of several of the other papers in this bibliography.

RATIONALE, AIMS AND OBJECTIVE: The effect of Electronic Medical Record (EMR) use on Patient–Doctor Communication (PDC) has rarely been studied. As data accumulate, the purpose of this article is to review the literature on EMR effect on PDC, to identify recurring themes and to offer preliminary guidelines and future directions for medical education and research.

METHOD: A database search was conducted and 14 articles that met inclusion criteria (published in the past 10 years, empirical investigations, direct assessment of the EMR impact on patient–doctor communication) were selected for review. A qualitative, grounded theory-like approach was employed to analyze the data.

RESULTS: EMR use often has a positive impact on information exchange, but exerts a negative influence on patient centeredness. Some physician characteristics such as their computer skills and behavioural style assist in overcoming this negative influence.

CONCLUSION: The use of EMR exerts both positive and negative impacts on physician–patient relationships. The negative impacts can be overcome by some simple means as well as better designs of EMR systems and medical education interventions. Physicians’ everyday practices of integrating EMR use into the clinical encounter as well as better design of EMR systems and EMR and communication training may facilitate PDC in computerized settings.


PURPOSE: Although there is significant interest in implementation of electronic health records (EHRs), limited data have been published in the United States about how physicians, staff, and patients adapt to this implementation process. The purpose of this research was to examine the effects of EHR implementation, especially regarding physician-patient communication and behaviors and patients’ responses.

METHODS: We undertook a 22-month, triangulation design, mixed methods study of gradual EHR implementation in a residency-based family medicine outpatient center. Data collection included participant observation and time measurements of 170 clinical encounters, patient exit interviews, focus groups with nurses, nurse’s ailes, and office staff, and unstructured observations and interviews with nursing staff and physicians. Analysis involved iterative immersion-crystallization discussion and searches for alternate hypotheses.

RESULTS: Patient trust in the physician and security in the physician-patient relationship appeared to override most patients’ concerns about information technology. Overall, staff concerns about potential deleterious consequences of HER implementation were dispelled, positive anticipated outcomes were realized, and unexpected benefits were found. Physicians appeared to become comfortable with the “third actor” in the room, and nursing and offi ce staff resistance to HER implementation was ameliorated with improved work efficiencies. Unexpected advantages included just-in-time improvements and decreased physician time out of the examination room.

CONCLUSIONS: Strong patient trust in the physician-patient relationship was maintained and work flow improved with EHR implementation. Gradual HER implementation may help support the development of beneficial physician and staff adaptations, while maintaining positive patient-physician relationships and fostering the sharing of medical information.


PROBLEM: How can physicians incorporate the electronic health record (EHR) into clinical practice in a relationship-enhancing fashion (“EHR ergonomics”)?

APPROACH: Three convenience samples of 40 second year medical students with varying levels of EHR ergonomic training were compared in the 2012 spring semester. All participants first received basic HER training and completed a presurvey. Two study groups were then instructed to use the EHR during the standardized patient (SP) encounter in each of four regularly scheduled Doctoring (clinical skills) course sessions. One group received additional ergonomic training in each session. Ergonomic assessment data were collected from students, faculty, and SPs in each session. A postsurvey was administered to all students, and data were compared across all three groups to assess the impact of EHR use and ergonomic training.

OUTCOMES: There was a significant positive effect of EHR ergonomics skills training on students’ relationship-centered EHR use (P < .005). Students who received training reported that they were able to use the EHR to engage with patients more effectively, better articulate the benefits of using the EHR, better address patient concerns, more appropriately position the EHR device, and more effectively integrate the EHR into patient encounters. Additionally, students’ self-assessments were
strongly corroborated by SP and faculty assessments. A minimum of three ergonomic training sessions were needed to see an overall improvement in EHR use.

NEXT STEPS: In addition to replication of these results, further effectiveness studies of this educational intervention need to be carried out in GME, practice, and other environments.

Silverman J, Kinnersley P: **Doctors' non-verbal behaviour in consultations: look at the patient before you look at the computer.** *British Journal of General Practice.* 2010;60(571):76-78.

Verbal communication in medical consultations is well recognised as being important to the delivery of medical care and is usually easy to interpret and analyse. It is discrete with clear endpoints, it occurs in a single mode, it is mostly under voluntary control, and communicates our cognitive thoughts more than our emotions. In contrast, nonverbal communication is less easy to interpret: it is continuous even in silence, can occur in several modes at once, operates at a less conscious level, leaks spontaneous cues, and is the channel most responsible for communicating attitudes, emotions, and affect. We should not be surprised, therefore, that non-verbal communication plays a significant role throughout the medical interview and is an important variable in doctor–patient interactions.

Non-verbal communication helps to build the relationship, provides cues to underlying unspoken concerns and emotions, and helps to reinforce or contradict our verbal comments. Non-verbal communication is at its most significant in the medical interview if it contradicts the message from verbal communication. When the two are inconsistent or contradictory, non-verbal messages tend to override verbal messages. This explains why a closed question accompanied by effective nonverbal communication will often lead to an open answer, and why patients do not necessarily believe a reassuring verbal comment if accompanied by contradictory facial expressions and vocal hesitancy. Two intimately related aspects of nonverbal communication in the interview require consideration: the non-verbal behaviour of patients and the non-verbal behaviour of doctors. As doctors, we need to recognise and explore patients’ non-verbal cues in their speech patterns, facial expressions, and body posture. But we need to be equally aware of our own non-verbal behaviour: how the doctor’s use of eye contact, body position and posture, movement, facial expression, and use of voice can all influence the success of the consultation.


Texting while driving is associated with a 23-fold increased risk for crashing and is illegal in most states. Using a cell phone while driving reduces the amount of brain activity devoted to driving by 37%. Multitasking is dangerous—cognitive scientists have shown that engaging in a secondary task disrupts primary task performance. Might physician typing into electronic health records pose similar risks? As when driving, physicians also need to be alert to environmental cues and unexpected turns. Multitasking can undermine the core activities of observation, communication, problem solving, and developing trusting relationships. Although it can be argued that texting is unrelated to the task of driving and that typing may be part of the patient care process, we believe the issue of distraction is nonetheless relevant, especially given the realities of information chaos during the encounter.


**HIGHLIGHTS:**
- Physicians reported spending 42% of consultation time in contact with the computer.
- Physicians reported a negative impact of computer use on communication.
- Patients have a positive perception of computer use on communication.
- Training programs are needed to enhance computer use in primary care settings.

**OBJECTIVES:** This study evaluated how physicians and patients perceive the impact of computer use on clinical communication, and how a patient-centered orientation can influence this impact.

**METHODS:** The study followed a descriptive cross-sectional design and included 106 family physicians and 392 patients. An original questionnaire assessed computer use, participants’ perspective of its impact, and patient centered strategies.

**RESULTS:** Physicians reported spending 42% of consultation time in contact with the computer. A negative impact of computer in patient–physician communication regarding the consultation length, confidentiality, maintaining eye contact, active listening to the patient, and ability to understand the patient was reported by physicians, while patients reported a positive effect for all the items. Physicians considered that the usual computer placement in their consultation room was significantly unfavorable to patient–physician communication.

**CONCLUSIONS:** Physicians perceive the impact of computer use on patient-physician communication as negative, while patients have a positive perception of computer use on patient-physician communication.

**PRACTICE IMPLICATIONS:** Consultation support can represent a challenge to physicians who recognize its negative impact in patient centered orientation. Medical education programs aiming to enhance specific communication skills and to better integrate computer use in primary care settings are needed.
As computer hardware becomes less expensive and computer software more sophisticated and easy to use, more physicians are using computers to take notes and keep records. Although computer use offers many benefits, there is concern about whether the use of computers in the examination room will interfere with the patient-physician relationship. This experiment surveyed patient satisfaction following examination by either of two physicians, one using pen-and-pencil note-taking, the other taking notes on a computer.

METHODS: Sixty patients consented to participate in this prospective, randomized, crossover study. In the first phase, 15 randomly selected patients were examined by Physician A, who made a handwritten record, and 15 by Physician B, who made a computer record. In the second phase, the physicians switched roles. After the examination, patients completed a questionnaire to assess their degree of satisfaction.

RESULTS: There were no significant differences in satisfaction between the group whose physician made a handwritten record as compared with those whose physician used a computer, nor was there an interaction between type of note-taking and physician. There was also no correlation between patient satisfaction and previous patient exposure to and use of computers.

CONCLUSIONS: This study demonstrated no decrease in patient satisfaction when a computerized patient record was introduced.

Stewart RF, Kroth PJ, Schuyler M, Bailey R. BMC Psychiatry, 2010, 10:3. The electronic version of this article is the complete one and can be found online at: http://www.biomedcentral.com/1471-244X/10/3 Accessed March 24 2016. Do electronic health records affect the patient-physician relationship? A before & after study of psychiatric outpatients

BACKGROUND: A growing body of literature shows that patients accept the use of computers in clinical care. Nonetheless, studies have shown that computers unequivocally change both verbal and non-verbal communication style and increase patients’ concerns about the privacy of their records. We found no studies which evaluated the use of Electronic Health Records (EHRs) specifically on psychiatric patient satisfaction, nor any that took place exclusively in a psychiatric treatment setting. Due to the special reliance on communication for psychiatric diagnosis and evaluation, and the emphasis on confidentiality of psychiatric records, the results of previous studies may not apply equally to psychiatric patients.

METHOD: We examined the association between EHR use and changes to the patient-physician relationship. A patient satisfaction survey was administered to psychiatric patient volunteers prior to and following implementation of an EHR. All subjects were adult outpatients with chronic mental illness.

RESULTS: Survey responses were grouped into categories of “Overall,” “Technical,” “Interpersonal,” “Communication & Education,” “Time,” “Confidentiality,” “Anxiety,” and “Computer Use.” Multiple, unpaired, two-tailed t-tests comparing pre- and post-implementation groups showed no significant differences (at the 0.05 level) to any questionnaire category for all subjects combined or when subjects were stratified by primary diagnosis category.

CONCLUSIONS: While many barriers to the adoption of electronic health records do exist, concerns about disruption to the patient-physician relationship need not be a prominent focus. Attention to communication style, interpersonal manner, and computer proficiency may help maintain the quality of the patient-physician relationship following EHR implementation.


OBJECTIVE: To review findings from studies of the influence of desktop computers on primary care consultations.


SETTING: The computerised catalogues of Medline, BIDS, and GPlit were searched, as well as conference proceedings, books, bibliographies, and references in books and journal articles.

SUBJECTS: 30 papers met the inclusion criteria and were included for detailed review.

INTERVENTIONS: A validated scheme for assessing methodological adequacy was used to score each paper.

MAIN OUTCOME MEASURES: Papers were rated on sample formation, baseline differences, unit of allocation, outcome measures, and follow up. Differences in outcomes were also recorded.

RESULTS: Four of the six papers dealing with the consultation process showed that consultations took longer. Doctor initiated and “medical” content of consultations increased at the expense of a reduction in patient initiated and “social” content. Each of the 21 studies which looked at clinician performance showed an improvement when a computer was used (from 8% to 50%, with better results for single preventive measures). Only one of the three studies looking at patient outcomes showed an improvement (diastolic blood pressure control 5 mm Hg better after one year, with fewer doctor-patient consultations).

CONCLUSIONS: Using a computer in the consultation may help improve clinician performance but may increase the length of the consultation. More studies are needed to assess the effects on patient outcomes of using a computer in consultations.

AIMS: This thesis aimed to explore family physicians’ and patients’ perspectives and experiences of the patient-family doctor relationship when the Electronic Medical Record (EMR) was used during clinical encounters.

METHODS: Using qualitative methodologies, in-depth interviews of family physicians and focus group interviews of their patients were audio-taped and transcribed verbatim prior to independent and team coding. Iterative and interpretive analysis was conducted.

FINDINGS: The patient-family doctor relationship can be preserved in the presence of an EMR. Both patients and family physicians felt the EMR was external to their relationship, but essential to enhancing patient care and augmenting patient education. Physicians spoke of the EMR’s capacity to facilitate finding common ground, which promoted effective communication. Physicians employed behavioural strategies to overcome EMR barriers in order to maintain their relationship with patients.

CONCLUSIONS: Patients and family physicians endorsed EMR use. The EMR was external to the patient-family doctor relationship, and its value resided in its capacity to improve patient care and augment patient education. In essence, the EMR enhanced the patient-doctor relationship through these means.


The article begins with a colorful drawing by a 7-year-old girl of her visit to the doctor. It shows her sitting on the exam table and her mom holding her baby sister and her older sister sitting on a chair. In the corner is the physician, back to all of them, busy typing on the EMR. The article describes how unskilled use of the EMR and inappropriate placement of the monitor will interfere with effective communication between patient and physician.


CONTEXT: As electronic health records (EHRs) are adopted by teaching hospitals, educators must examine how this change impacts trainee development.

OBJECTIVES: We investigate this influence by studying clinician experiences of a hospital’s move from paper charts to an EHR. We ask: how does each chart modality present conceptions of time and data interconnections? How do these conceptions affect clinical reasoning?

METHODS: This two-phase, longitudinal study employed constructivist grounded theory. Data were collected at a paediatric teaching hospital before (Phase 1), during and after (Phase 2) the transition from a paper chart to an EHR system. Data collection consisted of field observations (146 hours involving 300 health care providers, 22 patients and 32 patient family members), think-aloud (n = 13) and think-after (n = 11) sessions, interviews (n = 39) and document retrieval (n = 392). Theories of rhetorical genre studies and visual rhetoric informed analysis.

RESULTS: In the paper flowsheet, clinicians recorded and viewed patient data in chronologically organised displays that emphasised data interconnections. In the EHR flowsheet, clinicians viewed and recorded individual data points that were largely chronologically and contextually isolated. Clinicians reported that this change resulted in: (i) not knowing the patient’s evolving status; (ii) increased cognitive workload, and (iii) loss of clinical reasoning support mechanisms.

CONCLUSIONS: Understanding how patient data are interconnected is essential to clinical reasoning. The use of EHRs supports this goal because the EHR is a tool for collecting dispersed data; however, these collections often deconstruct data interconnections. Where the paper flowsheet emphasises chronology and interconnectedness, the EHR flowsheet emphasises individual data values that are largely independent of time and other patient data. To support trainees to work with EHRs, the ways of thinking and acting that were implicitly learned through the use of paper charts must be made explicit. To support clinical reasoning, medical educators should provide lessons in connectivity – the chronologically framed data interconnections upon which clinicians rely to provide patient care.

Ventres W, Kooienga S, Marlin R, Vuckovic N, Stewart V. (Multnomah County Health Department, Mid-County Health Center, Portland, OR 97236, USA. william.b.ventres@co.multnomah.or.us). Clinician style and examination room computers: a video ethnography. Fam Med, 2005 Apr;37(4):276-81.

BACKGROUND AND OBJECTIVES: The use of computers in medical examination rooms is growing. Advocates of this technology suggest that all family physicians should have and use examination room computers (ERCs) within the near future. This study explored how family physicians incorporate the use of ERCs in their interactions with patients.

METHODS: This qualitative study involved five family physicians, one family nurse practitioner, and a convenience sample of 29 patients. Data included videotaped visits, clinician interviews, and videotape reviews. The setting was an urban family practice with a 7-year history of viewing electronic medical records. The main outcome measures were themes emergent from videotaped data.
RESULTS: We identified three distinct practice styles that shaped the use of the ERC: informational, interpersonal, and managerial styles. Clinicians with an informational style are guided by their attention to gathering data as prompted by the computer screen. Clinicians with an interpersonal style focus their attention and body language on patients. Clinicians with a managerial style bridge informational and interpersonal styles by alternating their attention in defined intervals between patients and the computer.

CONCLUSIONS: Family physicians have varying practice styles that affect the way they use examination room computers during visits with patients.


PURPOSE: Little is known about the effects of the electronic health record (EHR) on physician-patient encounters. The objectives of this study were to identify the factors that influence the manner by which physicians use the EHR with patients.

METHODS: This ethnographic study included 4 qualitative components: 80 hours of participant observation in 4 primary care offices in the Pacific Northwest; individual interviews with 52 patients, 12 office staff members, 23 physicians, and 1 nurse-practitioner; videotaped reviews of 29 clinical encounters; and 5 focus-group interviews with physicians and computer advocates. The main outcome measures were factors that influence how physicians use the EHR. Researchers qualitatively derived these factors through serial reviews of data.

RESULTS: This study identified 14 factors that influence how EHRs are used and perceived in medical practice today. These factors were categorized into 4 thematic domains: (1) spatial—effect of the physical presence and location of EHRs on interactions between physicians and patients; (2) relational—perceptions of physicians and patients about the EHR and how those perceptions affected its use; (3) educational—issues of developing physicians’ proficiency with and improving patients’ understandings about EHR use; and (4) structural—institutional and technological forces that influence how physicians perceived their use of EHR.

CONCLUSIONS: This study found that the introduction of EHRs into practice influences multiple cognitive and social dimensions of the clinical encounter. It brings into focus important questions that through further inquiry can determine how to make best use of the EHR to enhance therapeutic relationships.


Two of the most important developments in ambulatory practice over the past 20 years are the advent of patient and relationship-centered care (PRCC) and electronic health records (EHRs). However, there is a large gap in knowledge and practice between PRCC and EHR use. We believe the integration of PRCC with EHRs has the potential to personalize care, improve population-based care, and increase patient involvement. To accomplish this, advanced practitioners from both computer- and communication-centric disciplines must work together to establish systems that work synergistically. Research examining how outstanding clinicians use EHRs is essential to establish best practice models of use. As well, clinicians must examine how they use EHRs in their communication with patients, become aware of when the EHR hinders the human connection and when it enhances it, and develop a repertoire for using it simultaneously with PRCC.


BACKGROUND: The author reviews his personal history learning to use Electronic Health Records (EHRs) and examination room computers. He asks key questions that pertain to the use of EHRs in practice and discusses the current state of knowledge regarding EHRs and doctor–patient communication.

SUMMARY: He notes that—regardless of the ubiquity of computers in our society and the recognition that they are a part of current medical practice—one cannot just plop down a computer in the examination room, click “on,” and anticipate that communication between doctors and patients will flow smoothly.

CONCLUSIONS: He recommends the accompanying article by Duke, Frankel, and Reis (see p. 358 in this issue) as an excellent step-by-step guide for framing how to teach the basics of EHR use in clinical practice.

See Duke, Frankel & Reis: How to integrate the electronic health record and patient-centered communication into the medical visit: a skills-based approach.


On my first day as an attending physician in a new hospital, I found my house staff and students in the team room, a snug bunker filled with glowing monitors. Instead of sitting down to hear about the patients, I suggested we head out to see them. My team came willingly, though they probably felt that everything I would need to get up to speed on our patients — the necessary images, the laboratory results — was right there in the team room. From my perspective, the most crucial element wasn’t. For the next few weeks, I ensured that we spent as little time as possible in the bunker. These were excellent residents who cared enormously about patients’ welfare. They enjoyed being shown common findings — white nails of liver disease, an
accessory nipple, Dupuytren’s contracture, parotid enlargement, spider angiomas, café au lait spots, the paradoxical splitting of the second heart sound in left bundle-branch block, signs of pseudo-bulbar palsy — which today are uncommonly recognized. When I stroked a patient’s palm and caused a twitch of the mentalis muscle under the chin — the palpebral reflex — it was as if I were performing magic.


While electronic health record (EHR) use is becoming state-of-the-art, deliberate teaching of health care information technology (HCIT) competencies is not keeping pace with burgeoning use. Medical students require training to become skilled users of HCIT, but formal pedagogy within undergraduate medical education (UME) is sparse. How can medical educators best meet the needs of learners while integrating EHRs into medical education and practice? How can they help learners preserve and foster effective communication skills within the computerized setting? In general, how can UME curricula be devised for skilled use of EHRs to enhance rather than hinder provision of effective, humanistic health care? Within this Perspective, the authors build on recent publications that “set the stage” for next steps: EHR curricula innovation and implementation as concrete embodiments of theoretical underpinnings. They elaborate on previous calls for maximizing benefits and minimizing risks of EHR use with sufficient focus on physician–patient communication skills and for developing core competencies within medical education. The authors describe bridging theory into practice with systematic longitudinal curriculum development for EHR training in UME at their institution, informed by Kern and colleagues’ curriculum development framework, narrative medicine, and reflective practice. They consider this innovation within a broader perspective—the overarching goal of empowering undergraduate medical students’ patient and relationship-centered skills while effectively demonstrating HCIT-related skills.


BACKGROUND: Little is known about what primary care physicians (PCPs) and patients would expect if patients were invited to read their doctors’ office notes.

OBJECTIVE: To explore attitudes toward potential benefits or harms if PCPs offered patients ready access to visit notes.

DESIGN: The PCPs and patients completed surveys before joining a voluntary program that provided electronic links to doctors’ notes.

SETTING: Primary care practices in 3 U.S. states.

PARTICIPANTS: Participating and nonparticipating PCPs and adult patients at primary care practices in Massachusetts, Pennsylvania, and Washington.

MEASUREMENTS: Doctors’ and patients’ attitudes toward and expectations of open visit notes, their ideas about the potential benefits and risks, and demographic characteristics.

RESULTS: 110 of 114 participating PCPs (96%), 63 of 140 nonparticipating PCPs (45%), and 37 856 of 90 203 patients (42%) completed surveys. Overall, 69% to 81% of participating PCPs across the 3 sites and 92% to 97% of patients thought open visit notes were a good idea, compared with 16% to 33% of nonparticipating PCPs. Similarly, participating PCPs and patients generally agreed with statements about potential benefits of open visit notes, whereas nonparticipating PCPs were less likely to agree. Among participating PCPs, 74% to 92% anticipated improved communication and patient education, in contrast to 45% to 67% of nonparticipating PCPs. More than one half of participating PCPs (50% to 58%) and most nonparticipating PCPs (88% to 92%) expected that open visit notes would result in greater worry among patients; far fewer patients concurred (12% to 16%). Thirty-six percent to 50% of participating PCPs and 83% to 84% of nonparticipating PCPs anticipated more patient questions between visits. Few PCPs (0% to 33%) anticipated increased risk for lawsuits. Patient enthusiasm extended across age, education, and health status, and 22% anticipated sharing visit notes with others, including other doctors.

LIMITATIONS: Access to electronic patient portals is not widespread, and participation was limited to patients using such portals. Response rates were higher among participating PCPs than nonparticipating PCPs; many participating PCPs had small patient panels.

CONCLUSION: Among PCPs, opinions about open visit notes varied widely in terms of predicting the effect on their practices and benefits for patients. In contrast, patients expressed considerable enthusiasm and few fears, anticipating both improved understanding and more involvement in care. Sharing visit notes has broad implications for quality of care, privacy, and shared accountability.


BACKGROUND: In designing electronic personal health records (PHRs) and related health technologies, lay perspectives are rarely solicited, and we know little about what individuals want and need.
OBJECTIVE: To learn how diverse, primarily lay individuals envision how PHRs and other emerging and future electronic technologies could enhance their care.

DESIGN: Qualitative study of eight focus groups with adult consumers, patients, and health professionals.

PARTICIPANTS: Eighty-two adult frequent Internet users who expressed interest in health-related matters and represented diverse populations and a broad demographic range.

MEASUREMENTS: Focus group transcripts were analyzed qualitatively, using behavioral and grounded theory, employing an immersion/crystallization approach.

MAIN RESULTS: Individuals expect technology to transform their interactions with the health-care system. Participants want computers to bring them customized health information and advice: “I want the computer to know who I am.” They desire unfettered access to their health record: “I don’t know if I want to read [my entire record], but I want to have it.” They expect home monitors and other technologies will communicate with clinicians, increasing efficiency and quality of life for patients and providers. Finally, especially for the chronically and acutely ill, privacy is of far less concern to patients than to health professionals.

CONCLUSIONS: Focus group participants have dynamic ideas about how information and related technologies could improve personal health management. Their perspectives, largely absent from the medical literature, provide insights that health professionals may lack. Including a diverse array of individuals throughout the process of designing new technologies will strengthen and shape their evolution.


The authors describe how sharing the EHR between patient and physician can enhance the patient’s involvement in decisions regarding their care as well as improving the relationship between them. “Introducing the EHR with a verbal explanation and patient-centered body language, by positioning the screen as a bridge rather than a divider, could enhance the relationship and jumpstart the process of activation. Dialogue is an important component of this process: “If you don’t mind, I am going to be typing as you speak. I’m happy to show you what I’m writing”; “I’m going to look up your test results, would you like to look at them together?”; “Let’s look at the trends in your blood pressure readings”; “Now that we’ve seen how you’re doing, let’s talk about how you can continue to improve...” These verbal and nonverbal cues could potentiate collaboration by facilitating a joint assessment of the patient’s current health status and highlighting opportunities for active patient involvement.