



## Capturing the patients' voices: Planning for patient-centered electronic health record use



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### ABSTRACT

**Objectives:** To understand (1) the perceptions of patients regarding use of EHR during clinic visits, (2) the impact of the presence of EHR on patient interactions with physicians, and (3) the ways in which EHR usage might increase patient engagement.

**Methods:** We conducted semi-structured interviews of a convenience sample of patients of internal medicine resident doctors from three primary care clinics. Interviews were audio-recorded and transcribed verbatim. We used thematic analysis to identify themes from the transcripts. Informed consent was obtained from each participant.

**Results:** We interviewed 32 patients; 37.5% male. Our analysis revealed three primary themes: (1) the views and beliefs of patients on the use of EHR in clinics, (2) patients' perception of the communication skills of residents, and (3) patients' perceptions about information sharing, patient engagement, and health education related to the EHR. An invitation to patients to view the screen as the physician interprets its content increases patient satisfaction and understanding. Residents' possessed skills in communication is not impeded when using EHR.

**Conclusion:** Patients generally express a positive or neutral perception of EHR use during clinic visits. Using information voiced by patients, we can teach health providers EHR strategies that are likely to engage patients in the visit and engender their trust.

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## 1. Introduction

Electronic health records (EHR) have become the third party in primary care examination rooms over the last decade [1,2]. The adoption of EHR has increased rapidly due to the American Recovery and Reinvestment Act of 2009 (HITECH), which provided an incentive program that offered payments to health care professionals who adopt and use EHR in a meaningful way [3,4]. The promised benefits of EHR have been reported as improvements in quality, safety, decision making, information exchange and efficiency [5,6]. Despite the increased use of computers and potential positive effects, downsides have also been reported [7–9]. Specifically, the presence of computers in the examination room and documenting in the EHR during the visit can have adverse effects on physician–patient communication, developing rapport with patients, and

psychological and emotional talk which are considered essential elements of patient-centered communication [7,10–12].

Patient–physician communication is the backbone of the primary care visit, since it influences patient satisfaction, adherence to treatment, clinical outcomes, and patient trust [13–16].

There have been early studies focusing on the impact of computers in examination room [17], video observation studies exploring impact of computers on doctor–patient interactions [18], and quantitative studies examining satisfaction and perception of patients on exam room computers [19,20]. With the increased use and capabilities of EHRs and attention on patient centered care, the role of EHRs on patient centered care and patient engagement have become more notable [21]. Recent studies have increasingly focused on how EHR should be used and designed in more patient-centered ways [22]. Some of the studies have reported that EHR should be used as a communication and patient education tool (i.e. through screen sharing) [7,17]. Screen sharing is reported as a way to involve patients and improve real time doctor–patient communication [7,10,23].

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Several studies reported physicians' perceptions of patient centered EHR use [22,24], and some other opinion papers showed the importance of screen sharing for patient centered-EHR use [7]. However, we also need more comprehensive input from the patient for the current EHRs including its impact on patient engagement, their perception of providers' EHR use, as well as their perception on patient centered EHR use during the visit. Thus, more developmental research is needed on the potential for new information technologies to improve patient/family engagement. The purpose of this study is to understand patients' perceptions of providers' EHR use, the impact of the presence of EHR on their interactions with the doctor in the visit, as well as patient's suggestions for EHR use and design to improve their own engagement in the visit. The results of the study may help inform the design of the future EHR and also support training of more patient-centered EHR use.

## 2. Methods

### 2.1. Research settings

To identify patients' perceptions of residents' EHR-based communication skills in primary care exam rooms, we conducted semi-structured interviews with the patients seen by internal medicine residents in primary care clinics. The study was conducted at three Medical College of Wisconsin primary care clinics located in Milwaukee, WI. The same EHR system was used in all three clinics.

### 2.2. Data collection

We recruited patients of 17 residents from three different clinics. These residents volunteered to have their patients be invited to join the study. We focused on resident physicians because we wanted to understand their emerging comfort and early experience with using the EHR as a communication/education tool, rather than focusing on physicians with established EHR-related practices. We recruited a convenience sample of patients. We invited patients to participate if they met the following criteria: They had to be (1) a patient of a resident who volunteered to participate, (2) age 18 or over, (3) able to read and understand English, and (4) able to take part in a 30 min interview after their appointment. Patients who did not meet these criteria, or were unable to give informed consent were excluded. The Medical College of Wisconsin Institutional Review Board approved this study, with funding from the Clinical & Translational Science Institute of Southeast Wisconsin and the Medical College Physicians group.

This qualitative study was conducted using a semi-structured interview approach. This approach provided flexibility and allowed interviewer and participant to have open-ended dialogue to identify and explain important information. We developed an interview guide, which had 9 questions with probes. Questions centered on the patient's perceptions of the use of EHR in the examination room, the communication skills of the doctor, the impact of the EHR on patient engagement and education, and patients' suggestions for design improvements. The questions were initially based on the study team's research, team's review of literature and clinical experience. During the development of the interview guide, we held three pilot interviews to test the understandability and usefulness of the questions, and the interview guide was adapted based on those results. We also used an iterative approach to data collection, and we used that opportunity to adapt the interview guide to explore unexpected themes in subsequent interviews. The team reviewed transcripts of the first two interviews, after which the interview guide was further revised to elicit more detailed responses from subjects.

Over five months, we recruited patients on the days that participating residents had continuity clinic. The team arrived in the waiting room 30 min before appointments began and remained until all patients had arrived. The receptionist read a script to each patient who registered to see a participating resident, informing them of the study and directing them to the team for further questions. Patients who expressed interest were screened by the team to ensure eligibility. We provided the patients with a \$20 gift card for participating.

After completion of the clinic appointment, the RA met with the participant in a private room, explained the details of the study, and obtained written informed consent. The interviews were audio-recorded with the permission of the participants and transcribed verbatim. After concluding the interview, participants completed a short demographic survey.

### 2.3. Data analysis

We used an inductive thematic approach to analyze the data [20]. Transcripts were uploaded into NVivo 10 and coded by using this qualitative analysis software. The steps followed to analyze the data were as follows. First, we identified "sentence" as the unit of analysis/meaning, which identifies the level of the detail in the analysis [21]. Second, each transcript was reviewed several times to make sense of the data. Third, the entire team reviewed the initial 4 interviews for emergent codes and developed memos and preliminary interpretations. The team refined preliminary interpretations throughout this process and added new themes when necessary. Fourth, following this initial review process, we developed our code book with the definitions of each code. Fifth, systematic inductive coding was applied to the rest of the transcripts using the codebook. During team meetings, we reviewed the codes and text assigned to them and began with the process of identifying major categories. We also combined similar codes under categories/groups. Finally, the team summarized each utterance within each code for its condensed meaning. We discussed these condensed meaning units, came to consensus on discrepancies, and examined the range of opinions within each code. We then finalized our major categories and the codes under each. We discussed each new emerging condensed meaning units and added those codes until we achieved saturation. We conducted 32 interviews. Similar qualitative studies using semi-structured interviews reached saturation with 15–20 interviews [22,23].

### 2.4. Ensuring quality in the data

We followed several criteria to ensure rigor and quality as well as trustworthiness of the qualitative research. We ensured credibility with analyst triangulation (multiple researchers engaged in data analysis), the team members reading the transcripts, creating condensed meaning units, presenting the study in local research progress meetings, and presenting direct quotes in the results to provide evidence for analytical categories. We ensured dependability (reliability) with having a written interview guide, keeping a research diary to write down the steps of data analysis, creating a coding book for the analysis with all team members, auditing study instruments and data collection process, external auditing (presenting the method and result in an external meeting). Finally, we ensured conformability (objectivity), testing the interview guide with patients to make sure they have a common understanding with the researcher, meeting and discussing all interpretation of the data with skeptical view, triangulation, and involving researchers from various domains such as informatics and clinical practice.

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