Use of Computer Technology During Family-Centered Rounds: A Qualitative Study of Parent Perspectives

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A B S T R A C T

OBJECTIVES: Physicians often use computer technologies to assist in work activities, including family-centered rounds (FCR), but little is known about the attitudes of families on the use of these technologies. We aimed to describe these perceptions on the presence and use of computer technologies during FCR.

METHODS: We conducted observations of FCR from a parent's visual perspective to "see what they see." This was followed by in-depth interviews with the families of patients admitted to the hospitalist service at our institution to describe their experience with the use of computer technology by the medical team during FCR.

RESULTS: From the analysis of 31 individual interview transcripts, our research team identified the following 4 themes: (1) technology serves a purpose during FCR; (2) to view data in real time; (3) do not lose the human connection; and (4) transparency is valued. Thirty-eight observations showed broad use of computer technologies by the medical team. Devices were used to provide data that would educate the family; however, the devices were often placed between the medical team and family, creating a physical barrier.

CONCLUSIONS: Families recognized the benefit of computer technologies in the care of their child and would like greater sharing of information by the medical team. They insisted their child always be "placed first" and that the team be transparent with their use of technology. Computer technology may create possible obstructions and distractions to the medical team. As computer technologies become more commonplace in medicine, maintaining the essence of good patient-communication and family centered care is essential.

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Physicians and medical trainees are increasingly using different forms of computer technologies, including laptop computers, tablet computers and smartphones, to assist in their daily work activities of patient care, education and clinical communications.[1–4] With increasing access to computer technologies, the medical team may have instant access to electronic health records, a variety of medical applications and educational resources, and the most up-to-date medical literature.[5] Access to this trove of information facilitates the ability to solve clinical questions and aids in decision-making.[6] There is increasing evidence that patients view the use of computer technologies by physicians positively, particularly in outpatient settings.[4,7–10] However, little is known about the attitudes of families on the use of computer technologies in the inpatient setting, specifically on family-centered rounds (FCR).

FCR is the predominant rounding model in the inpatient pediatric setting.[11] FCR are designed to allow for an open discussion and the exchange of information between the medical team and the patient and family to allow for shared decision-making.[12] Computer technologies have the potential to facilitate and enhance this exchange of information equally among all participants.[13] These devices are multimedia teaching tools that can serve the learning needs of different levels of learners, including families and patients. However, physician concerns exist that increased technology in patient and family interactions may be a barrier to communication or are potential physician distractors.[6,7,13–15]

Assessing family members' and patients' perspectives on the use of computer technologies during FCR is vital to develop evidence-based strategies to promote practices to incorporate this technology in a manner that benefits all participants. By using a qualitative study design, we explored the perspectives of families and patients on the presence and use of computer technologies during FCR.

METHOD
Study Approach

We conducted a qualitative study in the fall of 2014 at a large tertiary care academic hospital where FCR are the standard model for inpatient rounds. Computer technology is typically used by the medical team during FCR for information sharing, data entry, and order entry. Types of computer technology used on rounds include laptop computers, computers-on-wheels, and electronic handheld devices such as tablet computers and smart phones.

We chose a qualitative basic qualitative interview design so we could develop a better understanding of patients' and families' perspectives regarding the use of technology during FCR.[16,17] By gathering and exploring these perspectives and constructs of families, we sought a pattern of meaning that would aide in understanding the role of technology during FCR.[16]

Participant Sampling

We used a convenience sampling technique to recruit families and patients who had participated in the FCR process. Patients and families who had participated in FCR on any of the 4 pediatric hospitalist service medical teams on the days the interviewer was available were invited to participate. The medical teams on FCR were comprised of a pediatric hospitalist attending, occasionally a pediatric hospitalist fellow, pediatric residents, medical students, and nurses. Patients admitted to these teams represent a variety of ages (0–21 years) and general pediatric medical conditions. Parents were primarily interviewed and patients were invited to participate in the interviews if they were capable and desired. Families with limited English proficiency were excluded.

All participants provided verbal consent to be interviewed. None of the investigators had any known previous relationships with the interview participants. We offered no incentives for participating in this study.

Data Collection

From October 2014 to December 2014, a trained interviewer conducted all the family and patient interviews to ensure uniformity. The interviewer was a medical student who had participated in FCR while on his pediatric clerkship and was trained in qualitative questioning. The interviewer used a question guide to explore the

perspectives of the participants on the use of technology by the medical team on FCR and sought clarification and elaboration when necessary. The question guide was first piloted with families and patients not enrolled in the study. Additionally, members of the hospital's Parent Family Advisory Council reviewed all interview questions for clarity. This final question guide was used for all interviews. Audio-recorded interviews were professionally transcribed, and any identifying information was removed. We did not collect demographic information about the participants.

The same interviewer also conducted visual observations of the medical team during FCR. The interviewer would take a position behind the family to observe the medical team's use of computer technology and to "see what the family and patient sees." Observations were completed in the morning of the same days as subsequent bedside interviews and were strictly a qualitative description of the medical team's use of technology and interactions with families around that technology. The observations did not use a checklist or observation tool.

Data Analysis

Two investigators (J.K. and P.B.) with experience in qualitative analysis reviewed the transcripts. Both investigators were inpatient providers who conducted FCR and routinely used computer technology during FCR.

Before reviewing transcripts, both investigators completed a journaling exercise to acknowledge their preconceptions about the use of computer technology during FCR.[16] The interviewer also conducted regular journaling to minimize bias and optimize transferability. By using qualitative content analysis techniques, both investigators independently read all the transcripts, identified statements of interest, and conducted individual open coding, followed by joint axial coding in which differences were reconciled through discussion.[16] Both investigators analyzed the transcripts iteratively and identified emerging themes. Saturation was achieved after 25 interviews because no new codes or themes were

generated. Techniques to ensure trustworthiness included triangulation of data sources (interviews and FCR observations), coding and analysis by both investigators, and providing rich description via the use of verbatim comments. The institution's institutional review board approved this study.

RESULTS

A total of 31 family units were independently interviewed. Each interview lasted 30 to 60 minutes. Codes that emerged were categorized into 4 primary themes: (1) technology serves a purpose during FCR; (2) to view data in real time; (3) do not lose the human connection; and (4) transparency is valued. Quotes representing these themes are contained in Table 1.

Technology Serves a Purpose on FCR

Families identified multiple purposes of technology during FCR. Families routinely discussed the importance of data gathering and retrieval using the electronic health record in the care of their child. They recognized the importance of the access and speed by which their child's health information can be retrieved, verified, and updated. They identified that the team regularly used their computers for diagnostic support or to conduct research to learn more about their child.

Parents reported that the medical team used computers as a form of communication with all members of the medical team. They cited ways for the primary team to be able to have conversations with consultants. Parents commented that technology was used to document conversations between the medical team and family.

To View Data in Real Time

Families expressed appreciation with the opportunities to be able to view data that the medical team was seeing. Types of data included radiologic images, laboratory values and trends, and vital sign trends. Families claimed that their ability to view data increased their understanding of their child's illness and felt that it was a way for the medical team to improve communication.

Some families expressed an interest in being able to see greater parts of the medical record to verify the entered

TABLE 1 Representative Quotes of 4 Primary Themes

Theme	Supporting Quotations
Technology serves a purpose during FCR	"I think it was pretty great because that's where I was given some information and taking some of my information and putting it into the computer . . . and also giving me feedback from the computer."
	"They should be trying to gather as much information as they can on their patients and they should research . . . because that's an important part of it, research on their computers, and just do the best to enhance their ability to tend to their patients."
	". . . it was beneficial because so many specialists are working on this particular case, so when each individual specialist adds a comment or updates their records they're [the medical team] able to see it when they come in, and they're [the medical team] able to provide me with accurate information."
	"Everything is in front of them and they can say . . . specifically what's going on and they can come to . . . their conclusions right there in front of . . . us and . . . we can hear what they're saying, you know, and . . . I can give them my input . . ."
To view data in real time	"I would like to see images of the pictures they took. Show the family what they are seeing."
	"I think that they should share them with the family during rounds like just showing them what they see even though a person may not understand it totally, but to just give me a picture of what you're looking at would be great! Like, showing me what a normal appendix looks like versus one that's not normal."
	". . . today was the first time I saw, when they showed the x-ray I was like in a little bit of a shock because you know I've never seen that before . . . so it was amazing. I liked it."
	"The more they can show to the family is good instead of just reading from a thing. I know they don't have to . . . but they are talking about our child . . . so maybe show us a little bit . . . like a confirmation."
	"At least I could see it as they are . . . talking about it . . . so there won't be . . . miscommunication."
	"I would like to be able to see assessment and plan . . . sometimes the team fails to communicate effectively. . . We've been here and a lot of times I don't know what's going on."
Do not lose the human connection	"Sometimes stop after they put everything in and then look at the mother or father and talk to them instead of just typing . . . and leaving . . . they need to stop and make eye contact and talk to the family and the patient."
	"To stay mindful that there's still a human in the room . . . [with] all the technology and . . . all the latest gadgets . . . you'll forget that some people just want the human touch . . . remain human at all times."
	". . . the technology's helpful but we still have to be dealing with individuals, the patient . . ."
	"Sometimes . . . I feel like they're just talking and looking at the computer. Look at me when you ask a question. It's more of a robotic-thing. My son is right here. You can look at him and see what's going on."
	"The impression of a monolithic wall of notebook [computers] might be . . . intimidating."
Transparency is valued	"I'm not sure what they were doing. I would assume taking notes and making it easier to chart stuff."
	"I think they are looking up resources and results. I would hope that's what they are doing."
	"I don't think they are on Facebook or anything. I think they are on there doing their job."
	"Say what you're doing. Be honest. Be upfront. Honest and upfront with us goes a long way."

information was correct or to address areas of misunderstanding or poor communication by the medical team. Several families suggested that only seeing a final report or synopsis of data would be sufficient.

Several families commented that they were not asked if they would like to view the medical team's computer screens or data. They also expressed discomfort with asking to view information along with the medical team.

Do Not Lose the Human Connection

Families stressed the importance that the medical team maintains focus on the patient and family and not on the computer screen. They were also appreciative when the medical team maintained eye contact or expressed empathy despite the presence of computer technology in the room, which might be a distraction or a barrier.

Some families expressed concerns that computer technology during FCR could be a physical barrier to physician–family and patient communication. There were also concerns that the presence of technology could be intimidating to a family and inhibit bidirectional communication.

Transparency is Valued

The families' comments suggested that the medical team was not being transparent about their use of computer technology during FCR. Families presumed the medical team was using computer technology for certain purposes, but uncertainty existed when families were unable to view the screen as well. Families appreciated when the team was able to communicate the function and use of computer technology during FCR.

FCR Observations

Thirty-eight unique FCR family-patient–medical team encounters were observed. On interview days, the interviewer joined rounds and noted observations about the dynamics of technology use during FCR with a goal of seeing what the family and patient sees. After 31 of these encounters, family units agreed to participate in the interviews described above. There was noted to be broad use of different types of computer technology present during FCR.

Technology was observed being used at times during each encounter by all members of the medical care team (attending physicians, residents, students, and nurses). The observer noted in 18 encounters the medical team used active family-patient engagement techniques, such as stepping out from behind their computer or laptop during discussions, lowering or closing the laptop during discussions, or sitting next to the parent or family and sharing the screen, that separated the medical provider from the technology being used. In 6 encounters, computer devices were observed to be positioned between the medical team and the family, which possibly created perceived obstructions to communication. In 8 encounters, technology was used to educate the family. Families were offered the opportunity to view data in 4 observed encounters (Fig 1).

DISCUSSION

To our knowledge, this study is the first qualitative analysis exclusively devoted to evaluating family and patient perspectives on the use of technology by the medical team during FCR. The authors of previous studies explored physician's perceptions of the interaction of technology and families during FCR.[6,18] In this qualitative study, we provide specific considerations for providers who seek to practice focused patient- and family-centered care as technology use becomes more ubiquitous during FCR.

The 4 primary themes that emerged from this process included: (1) technology serves a purpose on FCR; (2) to view data in real time; (3) do not lose the human connection; and (4) transparency is valued. Families recognized and commented on how valuable it was to have the medical team access their child's electronic medical record during FCR and sharing it with those present. They appreciated that immediate access of information and felt that it helped facilitate a conversation at the bedside. Families also expressed that the diagnostic support to the medical team and enhanced communication between medical providers that technology provides as important to the care of their child. This sentiment aligns with physician beliefs that technology can improve physician productivity; allow increased time
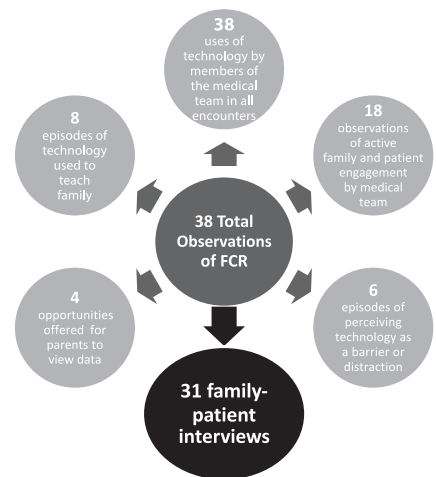

FIGURE 1 FCR observations. Thirty-eight observations by study team describing the use of technology during encounters between the medical team and families. Thirty-one of observed families agreed to be interviewed.

interacting with patients and potentially improve physician-patient communication.[4,19]

However, beliefs have existed among some physicians that technology has the potential to obstruct or harm these important interactions that are at the heart of FCR.[6,7,18] In this study, some families had the perspective that occasionally technology did interfere with communication skills or computers acted as physical barriers to patient-family–physician communication. Efforts to preserve the human connection such as regular eye contact, body positioning and openness, empathy, and speaking directly to the family and patient were described previously and supported by families in this study as important.[12] In observations, several engagement techniques were employed by medical providers. However, this was not consistent across all encounters and families did comment at times that the medical team did not maintain engagement or were too focused on their computers. For technology to remain a valuable tool for the medical team, it is imperative to mindfully integrate technology into FCR in a way that balances the benefits of technology while maintaining a focus on the child and family.

Technology used in FCR, although not a replacement for conversations with patients and families, can facilitate discussions and possibly enhance understanding on the part of families and patients, and can lead to better engagement and shared decision-making.[18,20] In the literature examining outpatient settings, the authors describe variable patient views on technology. Although some patients described a negative impact of increased technology on communication,[10,15] others expressed high levels of satisfaction with communication in regard to medical issues and medical decision-making.[7–9] Most families in this study expressed an interest at being able to view more data and have the medical teams share information through technology. Families indicated that being able to view images such as a radiograph or a growth chart increased their understanding of the diagnosis and medical plan of care. In our observations of FCR however, the medical team rarely offered to allow the family to view information. Furthermore, families stated that they do not feel comfortable or were too intimidated to ask the medical team to view information. Therefore, the medical team should offer an opportunity to the families to view images or other information.

The transparency and openness of the activities by the medical team using technology is valued by families. Families often commented on lack of transparency or uncertainty about how the medical team was using technology. There were no direct comments on what might be described as a breach of professionalism such as checking e-mail or nonmedical Web sites during FCR, but it appeared that the team did not often explain the purpose for the use of computer technology during FCR. Most families were left to assume the medical team was engaged in work-related activities but several did comment that they could not be certain. It will be important for medical providers to be upfront about how technology is being used during FCR and during other times of direct patient care.

There are several limitations to this study. These results represent the experiences of a single institution and therefore may not be generalizable. Neither demographic data nor information on medical problems (such as chronicity of disease and previous hospitalizations) were collected, which could limit application to certain populations. In addition, the team was aware of the role of the observer during FCR. This may have unintentionally changed the approach of the medical team's use of technology during FCR. In this study, we focused only on the pediatric hospitalist service, which may not relate to other inpatient providers. However, our findings of the importance of medical team communication, transparency, and maintaining a focus on the patient are unlikely to be limited to our pediatric inpatient setting. Future directions for study should include the perspectives of limited-English proficient families who may have different experiences because of varying levels of communication during rounds. Further investigation of the perspectives of patients themselves, as compared with their parents, may yield unique viewpoints.

CONCLUSIONS

We report the first study examining parental perspectives on the use of the increasingly prevalent use of computer technology in different forms on FCR. With our findings, we suggest that families recognize the benefits of technology use during FCR, and express a desire to view greater amounts of information regarding their child's medical problems. At the same time, medical providers using technology during FCR will need to remain mindful of the patient and family in the room, as well as be transparent of their use of technology with families.

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