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Title

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Permalink

https://escholarship.org/uc/item/3w56q60m

Journal

Hospital Pediatrics, 6(3)

ISSN

2154-1663

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Publication Date

2016-03-01

DOI

10.1542/hpeds.2015-0164

Peer reviewed

RESEARCH ARTICLE

Q:1, 2
Who's My Doctor? Using an Electronic Tool to Improve Team Member Identification on an
Q:3, 4
Inpatient Pediatrics Team

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A B S T R A C T

OBJECTIVES: Increase parent/caregiver ability to correctly identify the attending in charge and define terminology of treatment team members (TTMs). We hypothesized that correct TTM identification would increase with use of an electronic communication tool. Secondary aims included assessing subjects' satisfaction with and trust of TTM and interest in computer activities during hospitalization.

METHODS: Two similar groups of parents/legal guardians/primary caregivers of children admitted to the Pediatric Hospital Medicine teaching service with an unplanned first admission were surveyed before (Phase 1) and after (Phase 2) implementation of a novel electronic medical record (EMR)-based tool with names, photos, and definitions of TTMs. Physicians were also surveyed only during Phase 1. Surveys assessed TTM identification, satisfaction, trust, and computer use.

RESULTS: More subjects in Phase 2 correctly identified attending physicians by name (71% vs. 28%, $P < .001$) and correctly defined terms intern, resident, and attending ($P \leq .03$) compared with Phase 1. Almost all subjects (>79%) and TTMs (>87%) reported that subjects' ability to identify TTMs moderately or strongly impacted satisfaction and trust. The majority of subjects expressed interest in using computers to understand TTMs in each phase.

CONCLUSIONS: Subjects' ability to correctly identify attending physicians and define TTMs was significantly greater for those who used our tool. In our study, subjects reported that TTM identification impacted aspects of the TTM relationship, yet few could correctly identify TTMs before tool use. This pilot study showed early success in engaging subjects with the EMR in the hospital and suggests that families would engage in computer-based activities in this setting.

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Patients and families cared for in teaching institutions encounter multiple medical team members and trainees. In the hospital setting, increased trainee duty hour restrictions and patient care handoffs often exacerbate confusion about the identities and roles of treatment team members (TTMs).[1–3] Additionally, although patients and families deem that it is important to know the level of training of their physicians, few seem to actually know it.[2,4–6] In some cases, this lack of identification has had fatal consequences. One such case involving a 15-year-old patient in South Carolina led to statewide legislative change requiring clear identification of providers and their roles.[7,8]

In *The Principles of Team-Based Health Care,* the Institute of Medicine states, "Since roles on the team vary by both professional capability as well as function, patients and their caregivers must be fully informed about these roles."[9] Additionally, the Institute of Medicine's report *Crossing the Quality Chasm: A New Health System for the 21st Century* states, "the health care system should be responsive at all times (24 hours a day, every day)."[10] Although there are many studies showing improvement in TTM identification with use of paper solutions such as cards/handouts with names and photos, these print solutions may not adequately accomplish the goal of a real-time, responsive system.[11–15] They must be printed often due to the frequent TTM changes in teaching hospitals and require physical placement in a specific location. This process can become cumbersome and has many potential failure points. Consequently, the electronic medical record (EMR) may provide a novel opportunity to fulfill this need.

Studies have shown that physician use of the EMR poses no barrier to care and is associated with increased patient satisfaction. Additional studies have noted that patients want to be involved in the EMR and find it important. Most of these reports on patient EMR use have focused on messaging or education in the outpatient setting.[16–20]

The purpose of this study was to develop, implement, and assess the impact of an EMR-linked electronic tool to communicate the identity (picture with name), title, and role of TTMs in the inpatient setting. We hypothesized that subjects' ability to identify the attending in charge of their children's care by name and to define TTM roles would increase with use of the tool. Secondary aims included assessing subjects' satisfaction and trust; TTM opinions on subjects' ability to identify team members; and understanding subjects' usage of computers and preferred methods for communication in the hospital setting.

METHODS

This single-site prospective study was carried out at Rady Children's Hospital San Diego (RCHSD) in 2 phases (Phase 1, before tool use; Phase 2, after tool use) over a 17-month period (June 2012 to November 2013) on the Pediatric Hospital Medicine (PHM) service. RCHSD is the sole children's hospital in San Diego County, serving several neighboring counties in Southern California with a catchment of >800 000 children and 17 000 annual admissions. Patients from all payors and demographic groups are served, with 45% Hispanic ethnicity. The PHM service cares for 98% of all general pediatric inpatients, with >3000 annual admissions during the study period. Our intervention used the EMR, which was fully implemented in the inpatient setting by September 2011. Family-centered rounds were not standard practice during this time and were inconsistently performed. This project was approved by the University of California San Diego (UCSD) Institutional Review Board.

Tool

The "Who's My Doctor?" tool (Fig 1) was developed in conjunction with the RCHSD information systems (IS) team utilizing an existing web-based patient portal directly linked with the institution's EMR. This portal had already been in place in the outpatient setting and was modified for inpatient use for this study. The tool's information (names, pictures, and roles of TTMs) was auto-populated based on data entered by the team daily via the EMR. Team member changes occurred via the EMR at each shift change. TTMs added themselves to a discrete "treatment team" field in the EMR as part of existing practice. Team member assignments and changes in the EMR are mandatory for normal daily workflow (writing orders, notes, etc.) and thus this was not a new procedure. Only information related to the study tool (problem list, primary care provider, TTM information) was made available to the family for this study. Other EMR functionality typically used in the ambulatory setting was disabled (see Fig 1). An archive of participant photos from existing medical staff ID badge data and residency program photos was created by our IS team. These photos were connected by IS to the tool in the EMR system. Photo–name pair accuracy was validated by the principal investigator. The tool automatically populated the photos for a given patient based on the TTM assignment in the EMR. Team member changes were therefore immediate (real-time); if a subject accessed the tool during a time of team member change, the new member's data would be displayed afterward if the patient refreshed the screen or logged back in. The tool was therefore a readily available assistive means by which subjects could obtain information about their TTMs. No limit was placed on the amount of tool use to allow subjects to naturally assimilate to it.

Subjects

Subjects were defined as the parents/legal guardians/primary caregivers of patients on the PHM service with an unplanned first hospital admission during the study period. English- and Spanish-speaking families were enrolled. The caregiver spending the most time at the bedside was asked to participate. Subjects were excluded if the primary caregiver was unavailable or not willing to sign informed consent or if patients were wards of the court or had ever been admitted to RCHSD or another teaching (resident trainee) institution previously. The latter 2 requirements were used to eliminate potential bias from familiarity with RCHSD staff or exposure to a teaching team structure. Participation in the study was voluntary. Subjects could terminate their participation at any time.

In Phase 1, a member of the research team identified subjects meeting the inclusion criteria and obtained informed consent. The research team member then reviewed the survey with the subject and answered any questions in their preferred language. Subjects then completed the paper survey

- Return to My Record
- Blue Aguilera

Home
Current Admission
Message Center
Appointments
My Medical Record
My Family's Records

Billing & Insurance
Administrative
Preferences

Outpatient functionality only. Not enabled when patient was designated as an inpatient. Only tool as viewed here to the right was available

Welcome, Mom

Log Out

Cambiar a Español

Who's My Doctor? / ¿Quién es mi Médico?

Problem List — Date Reviewed: 8/1/2013

	Noted - Resolved
Bronchiolitis, acute	7/26/2013 - Present

PCP and Location

PCP	Location
	CHN MAIN CAMPUS[100101]

Treatment Team

Names	Title	Relationship	Photo
SINGH, AMIT T	MD	Resident	

Attending Provider

Names	Title	Photo
FISHER, ERIN	MD	

Provider Role Definitions

Intern: a doctor (MD) who has finished medical school who is in their first year of residency training. In basic terms, a first year resident.
  Interno (MD): esta palabra describe al médico que se encuentra en la capacitación de su primer año de residencia
Resident: a doctor who has finished medical school who is in ANY year of training of residency. We typically use this term to describe a senior resident who is a resident in their 2nd or 3rd and final year of training.
  Residente (MD): un médico que está terminado su residencia. La residencia es cuando un médico recibe capacitación adicional en un área especializada, como es pediatría, antes que pueda ser el médico supervisor. Usted puede tener varios residentes a diferentes niveles de entrenamiento que revisen a su hijo.
Fellow: a doctor who has finished medical school and a pediatrics residency, but is in extra training to learn a specific sub-specialty of pediatrics. For example, a pediatric cardiology fellow is a doctor who is training to be a Pediatric Cardiologist.
Nurse Practitioner: A special kind of nurse who has completed extra training and is qualified to treat certain medical conditions and diagnoses while working together with a supervising or attending doctor.
  Enfermera especializada: un tipo de enfermera que ha terminado una capacitación especial más allá del entrenamiento de una enfermera y que trabaja con el médico supervisor para proporcionar atención a su hijo.
Attending: the supervising doctor or head of the team. A doctor at this level has completed their residency training and is certified to be practicing as a licensed pediatrician or pediatric specialist.
  Médico supervisor: el médico que supervisa o es el líder del equipo médico. Un médico a este nivel es aquel que ha terminado su residencia y que puede practicar independientemente. Puede supervisar y capacitar a los residentes, internos y estudiantes médicos.
Specialist or Consultant: an attending physician who has completed not only a residency in general pediatrics but also in a specific field WITHIN pediatrics. An example would be a pediatric cardiologist (heart specialist) or pediatric pulmonologist (lung specialist for children) to name a few.
Registered Nurse (RN): a person who closely monitors your child by performing frequent assessments and checking their temperature and blood pressure. The nurse gives your child medications and helps to coordinate the care team. You will always have a nurse assigned to your child's care, day and night.
  Enfermera especializada (RN): una persona que monitorea de cerca a su hijo con evaluaciones frecuentes y revisando su temperatura y presión arterial. La enfermera administra medicamentos y ayuda a coordinar al equipo de cuidado. Usted siempre tendrá asignada una enfermera especializada para el cuidado de su hijo.
Respiratory Therapist (RT or RCP): providers who specialize in your child's breathing needs by doing frequent assessments, giving breathing treatments, medications, and providing education on breathing related conditions.
  Terapista respiratorio (RT): es el especialista que proporciona las necesidades respiratorias de su hijo con evaluaciones frecuentes, tratamientos, medicamentos y proporciona educación acerca de condiciones respiratorias.
Residency: a time of training during which an MD who has finished medical school is training in a general specialty such as Pediatrics or Family Practice, or any other specialty of medicine.

FIGURE 1 Who's My Doctor tool screen shot.

independently. A member of the research team was available at any time if subjects required clarification of any survey items. Surveys were collected, recorded, and coded by a member of the research team. The survey was reviewed when collected, and if some questions were unanswered, the subject was asked if this was intended; if not, they were then asked to complete the blank questions.

In Phase 2, a second similar cohort of subjects was identified and approached for consent using methods as in Phase 1. After obtaining consent, subjects were enrolled at the bedside on the patient portal Web site. After instruction, each subject created a unique log-in ID and password to access and view the tool. Subjects were encouraged to use the tool as much or as little as desired. The tool could be viewed from any device with internet access. Secure tablets were provided for study participants who did not have any such devices. After at least 24 hours of use and before discharge, subjects completed the Phase 2 study survey (see online Supplemental Information for full survey). Patients were allowed to use the tool as often as they liked to help them answer survey questions.

Treatment Team Members

TTM were defined as physicians in the UCSD PHM Division, UCSD pediatric and medicine/pediatric residents, and pediatric general nurse practitioners at RCHSD.

Team structure was not changed for this study. Patients are either cared for by a "Resident" (medical students/intern/resident/attending) or "PNP team" (pediatric nurse practitioner/attending) for their entire stay. Medical students were present on the wards equally in both phases. However, because of differing ward responsibilities and schedules, medical students were not included in the study. TTMs were not instructed to change the manner used to introduce themselves to patients and families. TTMs were also not specifically informed of which patients and families were participating in the study. To participate in the survey, TTMs were informed about the study via e-mail and invited to participate anonymously using an opt-in consent process. Those who consented were then presented with an anonymous electronic survey conducted via Survey Monkey (Palo Alto, CA).

Surveys

Basic identifying data collected included patient name, medical record number, admission date/time, attending of record, and principal diagnosis. The subject survey for each phase assessed subjects' ability to correctly identify and define roles of their TTM, and queried level of subject satisfaction and trust. To assess ability to identify their TTMs, subjects were asked questions such as, "Do you know which doctor is in charge of your child's care in the hospital? If yes, please give name" and "Do you know what it means when a doctor tells you he/she is a 'resident'?" To assess satisfaction and trust, subjects were asked, "How much does your ability to identify the primary treatment team affect your satisfaction with your child's care?" and "How much does your ability to identify who your treating doctors are affect how you trust them?" The Phase 2 survey included the same questions as Phase 1 as well as additional questions regarding the tool itself such as, "Did the 'Who's my Doctor?' tool help you answer any of the questions above?" and "How helpful did you find the tool?" Subjects were allowed to use the tool as often as they liked to help them answer survey questions, reflecting real-world use of this assistive tool.

Answer choices for both phases were reported as yes/no, free-response, or graded Likert scale (see Supplemental Information online for full surveys). Credit was given for correct last name if spelled correctly (eg, Singh), or nearly correctly (eg, Sing) with regard to attending identification. Credit was given for correctly defining attending, resident, or intern if key terms were used from the EMR tool during the Phase 2 survey. During the Phase 1 study, credit was given if subjects identified (1) "attendings" as "supervising doctor," "head of team," "completed residency," "pediatrician," or "pediatric specialist"; (2) "residents" as "doctor" or "MD" and "in any/second/third year of training"; (3) "interns" as "doctor" or "MD" and "first-year resident or training"; and (4) "nurse practitioner" as "special nurse," "nurse with extra training", or "working with an attending doctor."

Surveys for both phases asked about computer and internet usage and collected basic demographic data (subject age, race/ethnicity, gender, and highest educational level). Wherever possible, questions were taken from a standardized patient satisfaction questionnaire used by RCHSD (source, NRC Picker); others were created for the purposes of this study and were chosen based on review of existing literature concerning patient and family perspectives on team member identification and expert consensus among the authors. Questions were written to be brief and direct; however, we did not formally test for validity. We piloted our survey with a limited number of physicians not involved in this study before study initiation and made changes based on feedback.

TTMs were asked to report their training level (eg, resident, attending). Survey questions assessed TTM perceptions of subjects' ability to identify TTMs, as well as perceptions of the impact of this on patient satisfaction and trust. TTMs were surveyed only once (during Phase 1).

To assess perceptions of subject's ability to identify TTMs, questions were asked such as, "Do you feel confident after meeting the patient and/or family that they can identify you by name the following day?" To assess impact on subject satisfaction, TTMs were asked, "Do you think having the family know who you are and your role impacts their satisfaction with the care provided?" (see Supplemental Information).

Primary outcomes included the change in subjects' ability to identify attending physicians by name and their ability to define TTM roles between phases. Secondary aims included assessing both subjects' and TTMs' sense of importance of team member identification to subjects, and impact of this on communication, satisfaction, and trust. We also surveyed subjects' computer and internet use and preferred methods for communication in the hospital setting.

Statistical Analyses

Statistical calculations were done using SPSS 11.5 (College Station, TX). Descriptive statistics were conducted on all variables

using means and frequencies. Comparisons of responses from subjects in each phase as well as TTM responses were performed by using χ^2 tests (or Fisher exact tests when assumptions of χ^2 were not met) and t tests where appropriate.

Prior studies using paper charts or handouts showed much variability of subjects' baseline identification of TTMs as well as variable increases after interventions.[3,11,13,15] Based on previaous studies, we estimated that our baseline level of attending identification (in Phase 1) would be 20%. To detect a 25% difference in proportions with an α of 0.05 and power of 0.8, we calculated that we needed to enroll 60 subjects in each group.[21] All data were deidentified before analysis.

RESULTS

Demographics and Computer Use

In Phase 1, 62 subjects were approached, and 60 subjects were approached in Phase 2. Only 1 subject in each phase submitted incomplete surveys, and those responses were not included in the study. The final sample size in each phase was 61 and 59, respectively. Demographics are shown in Table 1. Overall internet access varied between phases, but not with regard to demographics (data not shown).

The TTM survey was completed by 63 of 72 (88%) possible respondents, the largest group being residents (28/63, 44%). Almost all trainees (47/54, 87%) and PHM faculty members (13/15, 87%) participated in the study.

Subjects

Subjects' ability to correctly identify the attending by name increased to 71% from 28% after tool use ($P < .001$). Improvements were also noted for correct definition of terms intern ($P = .03$), resident ($P < .03$), and attending ($P < .001$) (Fig 2). Most Phase 2 subjects agreed that the tool helped them answer the questions related to TTM identification and definitions (81%), and almost all (97%) found the tool extremely or somewhat useful. Almost two-thirds (61%) indicated they would not have been able to answer the questions without the tool.

TABLE 1 Demographic Data

Characteristic	Phase 1 ($n = 61$)	Phase 2 ($n = 59$)	P
n	61	59	
Age, years			.14
≤ 25	16 (26)	11 (19)	
26–35	21 (34)	31 (53)	
≥ 36	24 (40)	17 (28)	
Gender			.53
Male	11 (18)	14 (24)	
Female	47 (77)	45 (76)	
No response	3 (5)	0	
Education			.2
High school degree or equivalent	25 (40)	21 (35)	
Bachelor's degree	13 (21)	17 (29)	
Master's degree	6 (10)	7 (12)	
Professional degree such as MD, JD	1 (2)	3 (5)	
Other	11 (18)	10 (17)	
No response	5 (8)	1 (2)	
Ethnicity/race			.8
Hispanic	28 (46)	24 (40.7)	
White	20 (33)	22 (37.3)	
Black	5 (8)	5 (8.5)	
Asian	2 (3)	3 (5.1)	
Other	5 (8)	5 (8.5)	
No response	1 (2)	0	
Computer use			
Overall internet access[a]	47 (77)	56 (95)	.003
From home	43 (92)	50 (89)	
While roaming	35 (75)	31 (55)	
To communicate with child's provider[b]	12 (20)	16 (29)	.52

Values are presented as n (%).
[a] Multiple options for where subjects accessed the internet were allowed. Subsequent lines highlight these multiple options provided on the survey indicating access from multiple places (i.e., from home and while roaming).
[b] Any communication with child's primary healthcare provider (ever) was queried.

Subjects in both phases reported that their ability to correctly identify TTMs by name strongly or moderately impacted satisfaction (84%/95%), communication (87%/93%), and trust (79%/93%). The majority (72%/84%) indicated they always had trust and confidence in the doctors caring for their child. These responses did not differ significantly by demographics in either phase. Of Phase 1 subjects dissatisfied with the method used to inform them of who was caring for their child (21%), the majority (61%) preferred a nonpaper tool (electronic, organizational chart, or whiteboard).

In both phases, subjects were given 3 options regarding preferred use of a computer to better understand their child's treatment team: in conjunction with the medical team only, by themselves only, or a combination. The majority (62%/78%) preferred a combination. Almost all expressed interest in using computers to better understand their child's treatment team (95%/98%) and plan of care (84%/97%). Other preferences for in-hospital computer use included internet access, games, and access to medical dictionaries and resources (all $<13\%$).

Photos were the "most liked" aspect of the tool. Among the responses for

25 (42%)

36 (61%)

29 (49%)

12 (20%)

11 (18%)

11 (18%)

Phase 1 (*n* = 61)

Phase 2 (*n* = 59)

P = .03

P <.03

P <.001

Intern

Resident

Attending
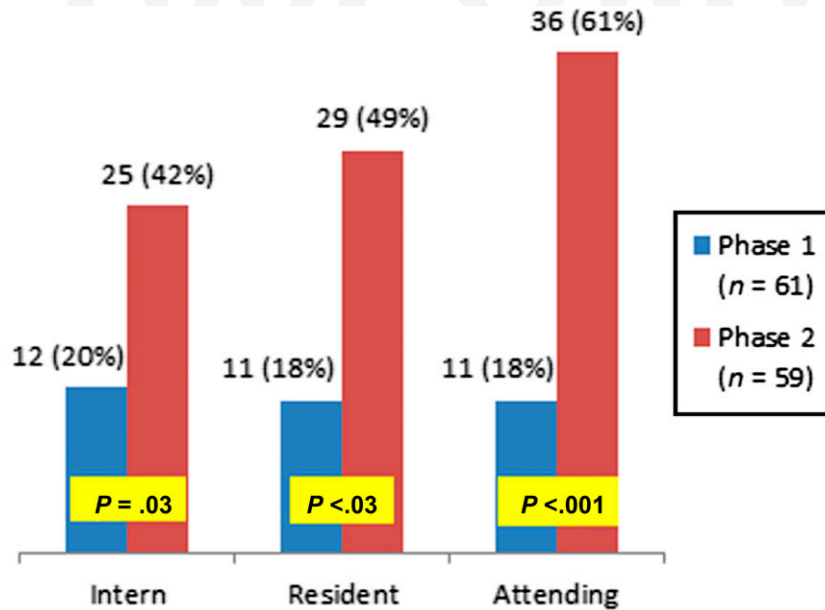
* *Note, only responses of subjects reporting they knew term definitions are noted*

FIGURE 2 Subjects' ability to define treatment team roles correctly. Note, only responses of subjects reporting they knew term of definitions are noted.

improvements, answers varied widely but surrounded further interest in seeing nursing staff photos, learning more about TTMs (biographical information), and wanting more medical information about their child. A few sample free response answers to the liked aspects of the tool included the following: "I loved the fact that it made me more aware of the levels of staff, knowing this allowed me to contact as needed for questions," and "I liked that it had a picture and a name. With all the different people coming into the room, it is sometimes hard to remember who is who."

Treatment Team Members

The majority (40/63, 64%) indicated that they "always" introduced themselves using the words "intern," "resident," or "attending" (Table 2). Very few (9%) of the TTMs surveyed felt confident that subjects could identify them by name the day after their first meeting. Name recognition (91%) and identification of level of training by subjects (84%) were rated important by almost all TTMs. However, most felt the meaning of these terms was understood by subjects only sometimes (73%) or rarely (22%).

Almost all felt that TTM identification impacted subjects' satisfaction (87%) and trust (89%). The majority felt that a standardized process for introductions was needed (64%), with about half (56%) preferring use of a paper handout with names and pictures. Almost all (97%) reported using the EMR as a teaching tool for families some or all of the time, predominantly for showing imaging results (79%), growth charts (56%), or laboratory values (39%).

DISCUSSION

We found that the use of an electronic tool to display TTMs to subjects significantly improved their ability to identify their attending physicians by name and correctly define treatment team roles. Although the benefits of similar visual tools in paper format have been demonstrated previously, our goal was to examine the impact of an adjunctive electronic tool designed for our subjects that was tied to our EMR. Importantly, despite the relatively few correct responses during Phase 1, almost all subjects in both phases reported that identification impacted not only their communication with the TTM, but also trust

and satisfaction. Although some previous studies have used similar tools in paper, album, card, or whiteboard format and tested recall ability after tool exposure,[13,15,22] other studies have not limited tool use and have shown positive results in subjects' ability to correctly identify their physicians.[3,23,24] Our intent was not to test recall, but to integrate an assistive tool intended to be used throughout the hospital stay. Our focus was to assess the impact of our readily available, real-time-updated, EMR-linked electronic tool when used as preferred by subjects.

It was notable that despite the majority of TTMs surveyed who felt that subjects did not understand the role terminology well, more than half used the words "intern," "resident," or "attending" to describe themselves. TTMs were also not confident that subjects could identify them the day after their first meeting but agreed that they place high importance on their ability to do so. This illustrates a need for an improvement in the process of TTM identification for hospitalized families, and that verbal introductions alone are likely not sufficient to allow for full retention.

Table 2 Treatment Team Members Survey Responses for Select Questions (*n* = 63)

Question and Response	*n*	%
When you introduce yourself to the patient or their family for the first time, do you identify your role by the words intern/resident/fellow/nurse practitioner/attending?		
All the time	40	64
Sometimes	16	25
Rarely	7	11
Never	0	0
Do you feel confident after meeting the patient and/ or family that they can identify you by name the next day?		
Yes	6	10
Sometimes	48	76
No	9	14
How important do you think it is for the family or patient to correctly identify you by name?		
Extremely important	10	16
Somewhat important	47	75
Not very important	6	10
Not important at all	0	0

The direct impact of correct identification of attending physicians and TTMs on clinical care outcomes such as length of stay or readmission rates has not been well studied. Our study, however, found a positive effect on important aspects of the patient experience and did so by engaging families in their children's EMR. Improving satisfaction and trust can help form a stronger therapeutic alliance with the family. This alliance is central to shared decision-making both on a daily basis and for discharge and posthospital care planning. Additionally, hospitals and payors are increasingly using markers surrounding patient satisfaction as evidence of quality of care and to drive reimbursement. Perhaps even more importantly, patients and families have a fundamental right to know who is treating their child. This knowledge can be paramount to patient safety.[7,8,25] This is particularly highlighted in training institutions, as the Accreditation Council for Graduate Medical Education requires that patients know who is serving as their supervising physician and that they understand the roles of trainees in their care.[26] Our data and other previous studies looking at similar measures suggest we as a whole are not doing this well. The use

of a tool such as the one created here can aid with improving TTM identification and is a step toward addressing these weaknesses of our health care system.

Our data suggest that regardless of our demographics, our tool was well received and that the majority of subjects want to use electronic devices more during their child's hospitalization. Often, families have down time when their children are hospitalized where there is no active care taking place, which may be windows of opportunity for education about their children's hospitalization. Although this study only looked at effects of a team identification tool, it opens up the potential for countless other EMR-based applications for hospitalized families such as education about their child's medications and diagnoses and engagement in the daily plan.[27,28]

Some limitations to this study should be noted. It was performed on 1 pediatric hospital medical service at 1 tertiary teaching institution in a specific geographic location. However, the phenomenon of a hospital setting in which practitioners change often is not unique to teaching institutions, and the problem of TTM

identification is common.[2,11,12] It is possible that subject participation in the study affected team interactions with the families. This could have biased the team to be more explicit about identifying themselves than they might have previously to ensure a positive result or outcome. Additionally, as medical students were not included in the tool but still participated in patient care, their interactions with subjects may have influenced subjects' abilities to answer survey questions. Similarly, the subjects, once enrolled and aware of the focus of the study, may have paid more attention to identifying their TTMs. Furthermore, since the survey was completed independently, we cannot state whether the subjects received any assistance in completing the survey (from anyone including their partner/other parent, nurse, or children), which may have biased the results.

Although the subjects were not the exact same cohort, the makeup of the patients was quite similar. Additionally, our study design did not include a concurrent control group, and therefore, there is the possibility that we did not account for changes in subject awareness of hospital teams that resulted from other sources. However, at RCHSD, no new process or tool for TTM identification was in development or use during the study period other than our tool. Interestingly, access to the internet was increased in Phase 2 respondents; this may have positively biased the use of the tool. Additionally, the surveys used questions that were designed by the research team for the purposes of the study alone and not tested for their validity beyond general review among the contributing authors and two nonparticipating physicians. Development of validated survey items should be conducted for use in future studies in this area.

In our study, the tool's images and information were generated directly out of links from the EMR. These links require that the information in the EMR be correct and updated. Just as paper handouts require frequent printing and placement, the accuracy of the tool was dependent on TTMs being diligent about keeping their information updated in the EMR. This can be problematic, as demonstrated in

1 study about accuracy of a patient's medical team via information from the EMR.[29] Finally, at our institution, a single EMR with a common patient portal is used in all clinical environments, requiring substantial information systems support. Other institutions may not have such a system or may use different EMRs in various clinical settings. Consequently, novel tool creation may not be easy unless there is institutional support and priority set from the hospital administration.

CONCLUSIONS

In a pediatric teaching hospital where TTMs change often, it can be difficult for families to know who is in charge of their child's care at any point in time. Our electronic tool was developed from this need and showed a positive impact. TTM identification is a key aspect to safe patient care. Additionally, our data suggest that identification of TTMs affects not only satisfaction but trust in TTMs as well. Moreover, families want to increase their use of the EMR in collaboration with their providers, which offers additional opportunities for physician–family engagement. Future work should be done to explore other potential benefits of using the EMR in the inpatient setting to engage families and patients in their own care while they are hospitalized.

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Q:7

Q:8

AUTHOR QUERIES

AUTHOR PLEASE ANSWER ALL QUERIES

1—Please verify author names, degrees, and affiliations.

2—AU:For Affiliation d, please list the department or division within Rady Children's Hospital.

3—Please verify corresponding author's contact information.

4—Please confirm whether any funding for this research was provided by the National Institutes of Health (NIH). If so, provide relevant grant information.

5—Ref. 9, journal style is to list the first three authors then et al. Please provide the next two authors.

6—Ref. 21, Medline cannot find this journal "Inf Technol Learn Perform J". Please check the journal name. Please also provide the page range.

7—Ref 22, please provide the page range for this article.

8—Ref 27, Medline indexes "J Hosp Med" but cannot find a listing for this article. Please check the reference for accuracy. Please also provide the last page of the article if there is more than one.

Supplemental Information

SUBJECT (PHASE 1 AND PHASE 2) AND TTM SURVEY QUESTIONS

PHASE 1 Subject Questions:

1. Why do you think your child is in the hospital?

2. *Do you know which doctor is in charge of your child's care in the hospital?
   a) yes --- If yes, please give name: _____
   b) no
   c) not sure

3. Do you know that your child has a team of doctors taking care of him/her?
   a) yes   b) no

4. Did you feel like there was one doctor who was <u>leading the care</u> of your child when he/she was hospitalized?
   a) yes   b) no

5. Which team member helped you most to understand what is happening with your child?(list their name or any other identifying information about this person):
   _____

6. Do you know what it means when a doctor tells you he/she is an "intern"?
   a)yes   b)no

   If yes, what does that word mean to
   you?_____
   _____
   _____

7. Do you know what it means when a doctor tells you he/she is a "resident"?
   a)yes   b)no

   If yes, what does that word mean to
   you?_____
   _____
   _____

8. Do you know what it means when a doctor tells you he/she is an "attending"?
   a)yes   b)no   c)don't care

   If yes, what does that word mean to
   you?_____
   _____
   _____

9. Are you satisfied with the way you are informed of which doctors are caring for your child in the hospital?
   a) yes   b) no

- If **no**, how would you like to be informed of who is in charge of your child's medical care? (Choose one)
    1. Paper handout you are given
    2. Electronic tool you can access from your child's room at any time
    3. Other (please state):_____

    _____

    _____

10. How would you like to use a computer during the hospital stay to better understand your child's:

    Treatment Team Members:

    a. Only with a member of the team in the room to show me information
    b. Only by myself, after being shown how to access information
    c. A combination of a and b
    d. None of the above
    e. Other (please list) :

    _____
    _____
    _____
    _____
    _____

    Plan of Care:

    a. Only with a member of the team in the room to show me information
    b. Only by myself, after being shown how to access information (this information would be limited to that reviewed and then released by the team for you to read)
    c. A combination of a and b
    d. None of the above
    e. Other (please list) :

    _____
    _____
    _____
    _____

11. Please give us any other ideas of how you would like to see computers used during the hospital stay:
    List):

    _____
    _____
    _____
    _____

12. *Overall how would you rate the care you received at the hospital?
    a) poor   b) fair   c) good   d) very good   e) excellent

13. *Do you have confidence and trust in the doctors caring for your child?
    a) yes, always   b) yes, sometimes   c) no

14. *Would you recommend Rady Children's Hospital San Diego to a family member or friend?
    a) yes definitely   b) yes, probably   c) no

15. * Do you feel comfortable asking medical staff questions about your child's condition or treatment?
    a) Yes, completely   b) Yes, somewhat   c) No

16. How important is identifying your treating doctors to you?
    a) Extremely important
    b) Somewhat important
    c) Not very important
    d) Not important at all

17. How much does your ability to identify the primary treatment team affect your satisfaction with your child's care?
    a) Strongly affects it
    b) Moderately affects it
    c) Mildly affects it
    d) Doesn't affect it at all

18. How much does your ability to identify who your treating doctors are affect how you communicate with them?
    a) Strongly affects it
    b) Moderately affects it
    c) Mildly affects it
    d) Doesn't affect it at all

19. How much does your ability to identify who your treating doctors are affect how you trust them?
    a) Strongly affects it
    b) Moderately affects it
    c) Mildly affects it
    d) Doesn't affect it at all

20. Are you able to access the internet? **If yes**, continue below, *if no* please skip to **question 25**
    a) yes   b) no

21. Where do you access the internet? Choose all that apply:.
    1. At home
    2. At work
    3. At the library
    4. While roaming? (such as on a cell phone)
    5. Other (please list):_____
       _____
       _____

22. What types of computer activities do you like to do? Choose all that apply:
   1. web browsing
   2. email
   3. online shopping
   4. other (please state):_____

23. How often do you use your computer for non-work related (or leisure) activities in a given week?
   a. 1-5 hours
   b. 6-10 hours,
   c. 11-15 hours
   d. 16-20 hours
   e. 21 or more hours

24. Have you ever used the computer to communicate with your child's doctor or health care provider?
   a)yes   b)no

25. Please list your highest level of education
   a. High School degree or equivalent
   b. Bachelor's degree
   c. Master's degree
   d. Professional degree such as an MD, JD
   e. other (please list):_____

26. Do you or anyone in your family work at a teaching hospital?
   a) yes   b) no

27. Please indicate your gender:
   a) male   b) female

28. Please indicate which of these you feel best describes you:
   a) White   b) Black   c) Hispanic   d) Asian   e) other:_____

29. Please indicate your age in years:_____

indicates question from standardized NRC Picker questionnaire

PHASE 2 Subject Questions:

1. Why do you think your child is in the hospital?

2. *Do you know which doctor is in charge of your child's care in the hospital?
    a) yes --- If yes, please give name: _____
    b) no
    c) not sure

3. Do you know that your child has a team of doctors taking care of him/her?
    a) yes   b) no

4. Did you feel like there was one doctor who was <u>leading the care</u> of your child when he/she was hospitalized?
    a) yes   b) no

5. Which team member helped you most to understand what is happening with your child?(list their name or any other identifying information about this person):
    _____

6. Do you know what it means when a doctor tells you he/she is an "intern"?
    a)yes   b)no
    If *yes*, what does that word mean to you? _____
    _____
    _____

7. Do you know what it means when a doctor tells you he/she is a "resident"?
    a)yes   b)no
    If *yes*, what does that word mean to you? _____
    _____
    _____

8. Do you know what it means when a doctor tells you he/she is an "attending"?
    a)yes   b)no

    If *yes*, what does that word mean to you? _____
    _____
    _____

9. Did the "Who's my Doctor?" tool help you answer any of the questions above?
    a) yes   b) no

10. Would you have been able to answer the questions above if you did not have access to the "Who's My Doctor?" tool?
    a) yes   b) no

11. How helpful did you find the tool?
    a) extremely helpful
    b) somewhat helpful
    c) not helpful
    d) extremely unhelpful

12. This question has two parts, please read carefully.

    How would you like to use a computer during the hospital stay to better understand your child's:
    a) Treatment Team Members:
        i.   Only with a member of the team in the room to show me information
        ii. Only by myself, after being shown how to access information
        iii. A combination of a and b
        iv. None of the above
        v.   Other (please list) :

        _____
        _____
        _____
        _____

    b) Plan of Care:
        i.   Only with a member of the team in the room to show me information
        ii. Only by myself, after being shown how to access information (this information would be limited to that reviewed and then released by the team for you to read)
        iii. A combination of a and b
        iv. None of the above
        v.   Other (please list) :

        _____
        _____
        _____
        _____

13. Please give us any other ideas of how you would like to see computers used during the hospital stay (list):

    _____
    _____
    _____
    _____
    _____

14. What did you like about the "Who's My Doctor?" tool? Please write in the space below:

    _____
    _____
    _____
    _____
    _____

15. What did you *NOT* like about the "Who's My Doctor?" tool? Please write in the space below:

_____
_____
_____
_____
_____

16. Do you have any suggestions on how to improve the "Who's My Doctor?" tool? Please write them below:

_____
_____
_____
_____
_____

17. *Overall how would you rate the care you received at the hospital?
a) poor   b) fair   c) good   d) very good   e) excellent

18. *Do you have confidence and trust in the doctors caring for your child?
   a) yes, always   b) yes, sometimes   c) no

19. *Would you recommend Rady Children's Hospital San Diego to a family member or friend?
   a) yes definitely   b) yes, probably   c) no

20. *Do you feel comfortable asking medical staff questions about your child's condition or treatment?
   a) Yes, completely   b) Yes, somewhat   c) No

21. How important is identifying your treating doctors to you?
   a) Extremely important
   b) Somewhat important
   c) Not very important
   d) Not important at all

22. How much does your ability to identify the primary treatment team affect your satisfaction with your child's care?
   a) Strongly affects it
   b) Moderately affects it
   c) Mildly affects it
   d) Doesn't affect it at all

23. How much does your ability to identify who your treating doctors are affect how you communicate with them?
   a) Strongly affects it
   b) Moderately affects it
   c) Mildly affects it
   d) Doesn't affect it at all

24. How much does your ability to identify who your treating doctors are affect how you trust them?
   a) Strongly affects it
   b) Moderately affects it
   c) Mildly affects it
   d) Doesn't affect it at all

25. Are you able to access the internet? **If yes**, continue below, *if no* please skip to **question 30**
   a) yes   b) no

26. Where do you access the internet? Choose all that apply:.
   a) At home
   b) At work
   c) At the library
   d) While roaming? (such as on a cell phone)
   e) Other (please list):_____
   _____

27. What types of computer activities do you like to do? Choose all that apply:
   a) web browsing
   b) email
   c) online shopping
   d) other (please state):_____

28. How often do you use your computer for non-work related (or leisure) activities in a given week?
   a)1-5 hours   b)6-10 hours   c)11-15 hours   d)16-20 hours   e)21+ hours

29. Have you ever used the computer to communicate with your child's doctor or health care provider?
   a)yes   b)no

30. Please list your highest level of education
   a. High School degree or equivalent
   b. Bachelor's degree
   c. Master's degree
   d. Professional degree such as an MD, JD
   e. other (please list):_____

31. Do you or anyone in your family work at a teaching hospital?
   a) yes   b) no

32. Please indicate your gender:
   a) male   b) female

33. Please indicate which of these you feel best describes you:
a) White   b) Black   c) Hispanic   d) Asian   e)other:_____

34. Please indicate your age in years:_____

indicates question from standardized NRC Picker questionnaire

Treatment Team Members (TTM) Questions:

1. By clicking the 'accept" button below, I acknowledge that I understand that
   - My participation in this survey is entirely voluntary.
   - I will not have any personal identifiers associated with my responses.
   - Participation or non-participation is not a requirement made by my training program, employer, or immediate supervisor and will not affect my job/academic standing
   - I may choose to withdraw my participation at any time

   a) accept   b)do not accept →ends survey

2. Please indicate your level of training:
   a) Intern   d) Fellow
   b) Resident (PGY2)   e) Attending
   c) Resident (PGY3)   f) Nurse Practitioner

3. When you first introduce yourself to the patient or their family for the first time, do you identify your role by the words intern/resident/fellow/nurse practitioner/attending?
        a) all the time   b) sometimes   c) rarely   d) never

4. Do you feel the patient understands what you mean if you identify yourself with the word intern/resident/fellow/nurse practitioner/attending?
        a) all the time   b) sometimes   c) rarely   d) never

5. Do you feel confident after meeting the patient and/or their family for the first time that they can identify you by name the following day?
        a) yes   b) sometimes   c) no

6. How important do you think it is for the family or patient to correctly identify you by name?
   a) Extremely important   b) Somewhat important c) Not very important d) Not important at all

7. How important do you think it is for the family or patient to correctly identify your level of training?
   a) Extremely important   b) Somewhat important c) Not very important d) Not important at all

8. How do you introduce yourself and explain your role to the family when you first meet them? Please write in the space provided:_____

9. Do you think having the family identify who you are and your role impacts their satisfaction with the care provided?
   a) yes   b) no   c) not important

10. Do you think having the family identify who you are and your role impacts their trust with the inpatient treating team?
   a) yes   b) no   c) not important

11. Do you think a standardized way of introducing the family/patient to the main treatment team is necessary compared to the current way it's done now?
   a) yes   b) no   c) not important

12. What kind of tool would be best?
   a. Paper handout given to the family with names
   b. Paper handout given to the family with names and pictures
   c. Paper handout attached to bedside in room with names
   d. Paper handout attached to bedside in room with names and pictures
   e. Electronic tool family can access from computer in room with names and pictures
   f. Other (please type your response here):_____

13. Have you utilized the EMR as a teaching/education tool for families? (examples might be showing vital sign trends, growth charts, radiographs, lab result trending, etc.)
   a) all the time   b) sometimes   c) rarely   c) never

14. In what ways have you utilized the EMR as a teaching/education tool for families? Please write your response:_____

15. How do you think the patient and/or family would like to use a computer during the hospital stay for understanding treatment team members?
   a. Only with a member of the team in the room to show them information
   b. Only by themselves (w/o team member) after being shown how to access information
   c. A combination of the above
   d. None of the above
   e. Other (please type your response here):_____

16. How do you think the patient and/or family would like to use a computer during the hospital stay for understanding care and plans?
   a. Only with a member of the team in the room to show them information
   b. Only by themselves (w/o team member) after being shown how to access information
   c. A combination of the above
   d. None of the above
   e. Other (please type your response here):_____

17. Please give us any other ideas of how you think *patients and families* would like to see computers used during the hospital stay:
   List: _____

18. Please give us any other ideas of how *you* think computers should be used by patients and families during the hospital stay:
   List: _____

AUTHOR QUERIES

AUTHOR PLEASE ANSWER ALL QUERIES

There are no queries in this article.