Finding Answers: Information Needs of a Multidisciplinary Patient Care Team in an Emergency Department

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Abstract

Emergency Departments (ED) are fast-paced, information-intensive environments where patient care team members must address their information needs quickly and accurately. We conducted a qualitative field study of an ED team in a rural hospital to understand their information needs. We observed that the most commonly asked questions related to patient specific information but that they also had number of organizational questions. We also found that non-clinical members of the team, such as the unit secretary, played a critical role in helping find needed information.

Information Needs in Hospitals

Hospitals are complex, information-rich environments in which collaboration is important to provide appropriate patient care. In these environments, multidisciplinary patient care teams are becoming an essential component of medical care. For all the benefits that these teams can provide[1], they face challenges in addressing their information needs. These challenges range from accurately identifying needed information to rapidly accessing it. Finding this information is vital to providing appropriate patient care. However, we are only in the early stages of understanding the information needs of patient care teams in complex, information-intensive settings. Before we can design information tools to support the information seeking activities of patient care teams, we need to understand their information needs.

In this study, we examine the information needs of members of a multidisciplinary patient care team in an emergency department (ED) of a rural hospital. This study improves our understanding of clinical information needs in three important ways. First, most studies of information needs focus on individual healthcare professionals, however, we examine the information needs of healthcare professionals in the context of a collaborative patient care team. Furthermore, through this study, we are able to compare the information needs of a patient care team in a rural hospital with the information needs of a patient care team in an urban setting[2]. Second, we were unable to identify any studies of information needs of teams in an ED. This study begins to help fill that gap in the research literature. Finally, although some information needs studies discuss the importance of other clinical healthcare workers in the information seeking process, there has been little attention paid to the role that non-clinical team members in the information seeking process. Our discussion of the unit secretary in the patient care team provides insight into roles that non-clinical team member play in satisfying team information needs.

The work of team members in the ED requires them to find information quickly and accurately. To develop tools that can help them with these activities, we must first understand their information needs.

Information Needs and Seeking Studies

Medical informatics researchers have long studied the information needs of individual medical professionals. They have examined such issues as the type of information needs and information sources. Researchers have focused a great deal of attention on the information needs of physicians in a variety of settings such as physician's offices[3] and academic institutions[4]. Other researchers have focused on the information needs of nurses and ancillary healthcare workers[5]. Besides information needs, researchers have been interested in identifying the variety of information sources used by healthcare professionals. The sources range from textbooks and journals[6] to more informal sources such as colleagues[7]. One of the main reasons given for consulting colleagues was not just to get information, but to seek "reassurance as well"[6].

Although there have been numerous studies of information needs of individual healthcare providers, there are relatively few studies in medical informatics of the information needs of teams. Reddy et al.[2] examined the information needs of a multidisciplinary patient care team in a surgical intensive care unit. They identified the importance of organizational information during patient care. Gorman et al.[8] described how team members in an intensive care unit use different information sources to meet their infor-

mation needs. Finally, Forsthye et al.[9] examined the information needs of physicians in patient care teams. Outside the medical informatics field, researchers have examined the information needs of teams in different settings such as military command and control centers[10], academic research institutions[11], and design teams[12].

Research Methodology

This study examines the information needs of patient care team members in the ED of a 200-bed regional hospital in a rural midwestern town.

Procedures

Our approach to studying information needs in the ED relies heavily on qualitative research methods[2, 8, 9]. Our primary qualitative methods were observations and interviews. The second author spent over 100 hours observing the work of the ED patient care team and conducted over 25 formal and informal interviews with team members. She "shadowed" different team members during their shifts to get an in-depth understanding of their information needs. During the course of the observations, she noted questions as they were asked. The recorded notes and interviews were transcribed for analysis.

In particular, we used the critical incidents method[13] to understand team members' information needs and how they were addressed. We followed critical incidents, as they unfolded in real-time, from the start of the incident to its resolution. Critical incidents ranged from unexpected problems that suddenly occurred to critical, but less urgent, treatment decisions that the team had to make for a patient. We were particularly interested in capturing: what questions were asked, who asked the questions, and what information sources were used to answer the questions.

The use of qualitative methods was particularly appropriate here because of the contextual nature of the work. The observations and interviews provided meaningful insights about team member needs and their interaction with each other to address those needs. The two methods also allowed us to triangulate our findings. The study was approved by the hospital's institutional review board.

Research Site

The ED at Regional Hospital is a 25-bed unit that treats people who are suffering from a wide range of illnesses. The ED manages everything from children with fevers to severe motor vehicle accident victims. It is a busy unit that sees approximately 90 patients per day and more than 100 patients per day in the winter months.

The ED is split into two areas: Convenient Care Unit (CCU) and Urgent Care Unit (UCU). The CCU offers non-emergency, walk-in care for minor illnesses and injuries. It is staffed by a family nurse practitioner and a registered nurse. The much larger UCU handles more serious problems such as car accidents, sudden traumatic illnesses, and any other conditions that need immediate attention. The UCU is staffed by a multi-disciplinary patient care team consisting of physicians, nurses, and ancillary support staff.

The ED is an information-intensive environment with a variety of electronic, paper, and human resources. Some of these resources include:

- Electronic resources – Bedside monitors, electronic medical records, and web-based applications.
- Paper resources – Reference guides and paper charts.
- Human resources – Other healthcare workers and patients.

The ED team members utilized all these resources while seeking answers to their information needs.

Subjects

The ED multidisciplinary team consisted of:

- Physicians – One to two per shift
- Registered Nurses – Typically six per shift
- Family Nurse Practitioners – One in the CCU
- Paramedics – One in the UCU
- Unit Secretary – One per shift

Results

We noted a total of 602 questions during our observations. The questions were used to identify the unmet information needs of patient care team members. To allow us to compare our results from this study to one that we had conducted earlier in a surgical intensive care unit, we analyzed the questions in a similar manner[2]. The data was separated into three categories: (1) the type of question, (2) the information seeker, and (3) the information source for analysis.

Question Categories

We documented seven categories of questions that were primarily asked in the ED (Table 1).

- Patient Specific – Details about the individual patient. Ex: *Is the patient's blood pressure up?*
- Organizational – Policy, procedural, coordination, and capacity management issues in the unit. Ex: *Is there a seizure protocol?*
- Plan of Care – Action plan the team is implementing for the patient. Ex: *Can we do anything else to ease the patient's symptoms?*

- Further Details – Continued data gathering on some patient related issue. Ex: *What is the size of the catheter you have been trying to insert?*
- Teaching – Learning or training questions. Ex: *How do you apply an aluminum splint to a finger?*
- Medication – Pharmaceutical issues in the unit. Ex: *Can we substitute medications for this patient?*
- Miscellaneous – Unable to be correlated to aforementioned categories. Ex: *Is it okay with the patient if the home health equipment comes from this agency?*

Table 1. Question Categories

Question Categories	**Questions (n=602) 100%**
Patient Specific	348 (57.8%)
Organizational	157 (26.1%)
Plan of care	74 (12.3%)
Miscellaneous	13 (2.2%)
Further Details	4 (.7%)
Teaching	4 (.7%)
Medication	2 (.3%)

Organizational questions made up a significant portion of the questions asked by ED team members. We will discuss the specific types of organizational questions in the next section.

Information Seekers

With the rapid pace of work and attention that each individual patient needs in the ED, it was not surprising that nurses were the group that asked the most questions. Because of the limited number of physicians, the nurses provided most of the hands-on care; and therefore, asked the most questions (Table 2).

Table 2: Information Seekers

Information Seekers	**Questions Asked (n=602) 100%**
Nurses	336 (55.8%)
Physicians	101 (16.8%)
Paramedics	58 (9.6%)
Non-Team Members*	40 (6.6%)
Family Nurse Practitioners	24 (4.0%)
Unknown**	22 (3.7%)
Unit Secretary	21 (3.5 %)

* Non-team members included technicians, transport personal, non-ED physicians, and registration.
** When information seeker could not be identified, they were placed in the Unknown category.

Information Sources

Patients were the most important source of information. The ED team typically has limited knowledge of what has happened to the patient and the patient's medical condition. Therefore, the patient, if possible, has to answer a variety of questions about what brought them to the ED (Table 3).

Table 3: Information Sources

Information Source	**Questions Asked of Each Source (n=602) 100%**
Patients	284 (47.2%)
Nurses	123 (20.4%
Physicians	57 (9.5%)
Unit Secretary	35 (5.8%)
Patients' Visitors	30 (5.0%)
Unknown*	26 (4.3%)
Non-Team Members	19 (3.2%)
Paramedics	18 (3.0%)
Non-Human Sources**	8 (1.3%)
Family Nurse Practitioners	2 (.3%)

* When information source could not be identified, they were placed in the Unknown category.
** Non-human sources include electronic and non-electronic sources.

Discussion

In this section, we compare our findings between this study and our earlier one in the SICU to highlight interesting similarities and differences in team information needs. We also discuss two important issues to consider when designing information systems in an information-intensive and time-constrained environment such as an ED: (1) information flow and (2) organizational information.

Comparing Information Needs

In a previous study of team information needs in an SICU[2], we captured a variety of questions asked by team members in the unit. Although both the SICU and ED dealt with severely ill patients, the questions asked in each unit reflected the different information needs of the teams in the unit. These different information needs were directly related to the different organizational and clinical goals of each unit.

The clinical goals of each unit were slightly different. In the SICU, the primary clinical goal was to stabilize the patient over a period of time. Therefore, the most common clinical questions focused on the plan of care. On the other hand, in the ED, the goal was, in most cases, to identify the patient's problem. ED team members often have little information concerning admitted patients. For this reason, the most common clinical questions were directed at the pa-

tient. Although clinical questions were most often asked in both units, the types of clinical questions asked were different and reflected the different work and emphasis of each unit.

Each unit was also part of a unique organizational structure and this was reflected in the different percentage of questions in each category. The SICU was part of a large, teaching hospital, while the ED was part of a small, non-teaching hospital. The types of questions asked, information seekers, and information sources in the SICU reflected the role that residents and fellows played in the unit, whereas in the ED, there were no residents, so virtually no training questions were asked. The organizational structure of each unit played a strong role in determining the types of questions asked by team members in the specific unit.

The two units did have something in common. In both units, organizational information was essential for the teams to successfully complete their activities. The high occurrence of organizational questions in both settings highlights the importance of understanding the interrelationship between clinical and organizational aspects of work in clinical units. For these teams, it was not sufficient just to find clinical information because the clinical information by itself did not always allow team members to complete their activities. For instance, in the ED, team members often asked *organizational* questions about each other's work in order to coordinate the *clinical* care of the patient. The clinical work of the unit occurred within a particular organizational framework. Therefore, it was important for the teams to meet their organizational information needs.

Information Flow in the ED

In the ED, questions were often asked because of a breakdown in the information flows. Although some questions were asked to elicit opinions or confirm orders, many questions were asked because the questioner did not have the needed information to make or implement a decision.

The breakdown in the information flows in the ED occurred for three reasons. First, the information was not available when anticipated. For instance, a lab result was not ready when the physician expected it and he had to ask the unit secretary about the results. Second, the information was either incorrect or incomplete. Therefore, team members had to ask questions to find the correct or complete information. Finally, the information was delivered to the wrong person. Each of these situations has the potential to compromise patient care if not quickly resolved.

Information breakdowns in the ED were often dealt with by the team members collaborating with an important resource in the unit – the unit secretary. The unit secretary filled the role of *information gatekeeper*[14] in the information seeking process and served as an information resource for other people. She was the conduit between the ED and other hospital units, physicians outside of the hospital, other hospitals, and medical partners such as home healthcare providers. When a team member had questions regarding orders or results, or did not know where to look for information or who to call, they typically turned to the unit secretary for guidance. Many of the questions involved the unit secretary in the team information seeking process. The unit secretary's involvement highlights the important role that non-clinical members of the team can play in addressing team information needs especially when there is a breakdown in the information flow.

Organizational Issues in the ED

A large percentage of the questions noted during observations (26%) related to hospital policies, procedures, coordination issues, and capacity management issues. The answers to these organizational questions enabled the ED team to function more effectively and keep the unit running smoothly. Two interesting subsets of questions, coordination (17% of all questions) and capacity management (4% of all questions) were asked more often than expected. Yet, when examining these questions in the context of the unit, it was clear why they played such a prominent role.

Speed is essential in the ED. Quickly obtaining answers to questions regarding coordination is of the utmost importance because these answers allow the ED team to work effectively and efficiently. For instance, a coordination question such as **"**Can the patient receive their x-rays in radiology, or must the radiologist technician take the x-rays in the patient's room?" is an important one in the unit. In many cases, the patient needs x-rays to aid in the diagnosis of the medical problem. Some patients can be sent to the x-ray department, but other patients have to stay in the ED. Do they move the patient to x-ray or bring a portable x-ray to the patient? Team members must not only organize their own work, but also coordinate the work of other team members and healthcare professionals inside and outside the ED.

Space in the ED is a critical organizational resource. When the unit is full, only emergency ambulance cases are admitted and walk-in cases must wait, sometimes several hours, to be seen by a physician. Long wait times have serious repercussions for patients in terms of their medical needs and for the hospital in terms of patient customer satisfaction. Therefore, the ED staff must ensure that sufficient beds are available to allow patients to be admitted as quickly as possible. The flow of patients in and out of the unit is a constant concern for the ED staff. Therefore in-

suring they have the information to make these critical decision is crucial.

Limitations

The major limitation of this study was the use of a single observer in the ED. We were unable to document all the questions asked during our observations. However, we believe that the questions that we did gather represent the categories of questions asked by team members during the course of their work.

Conclusions

Patient care teams that work in environments such as an ED depend on finding accurate information quickly and efficiently in order to provide care to their patients. However, when this information is not readily available, team members rely on other team members to help them find the needed information. This interaction usually takes the form of questions being asked and answers being sought. This study has identified three important issues for medical informatics researchers to consider.

First, there is a strong connection between organizational and clinical questions in the ED. Although, we may tend to think of these questions as dealing with different issues, in reality, they are often tightly connected with each other and do not easily fall into any one category. These *"orgo-clinical"* questions drive many of the decisions in the unit.

Second, we need to consider the organizational facets of the work when designing clinical support systems. Clinical systems currently support patient records and order entry, but they should also support the day-to-day work necessary to keep the unit functioning. This includes supporting the activities surrounding coordination and capacity management.

Third, we need to consider the roles of non-clinical team members such as the unit secretary when designing systems. These team members often play an important role finding information but are not often taken into consideration when designing these tools

Through this study and our previous study in the SICU, we are starting to identify a set of common categories of patient care team information needs. These categories expand our understanding of the different types of information needs of patient care teams in information-intensive and time-stressed environments.

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