

A Comparison of Communication Needs of Charge Nurses in Two Operating Room Suites

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ABSTRACT: To achieve the potential inherent in the use of computer applications in distributed environments, we need to understand the information needs of users. Communication is the method by which information is transferred and is essential for all organizational interaction. The primary goal of operating room coordination is to insure the prompt, safe, and effective care of surgical patients. Nevertheless, larger organizational goals and characteristics can influence individual operating room information needs. The purpose of this paper is to describe the differing information needs in two operating suites by documenting the communication of OR charge nurses. A data collection tool was developed to record: 1) the purpose of the communication, 2) mode of communication, 3) the target individual, and 4) the length of time taken for each occurrence. The chosen data collection categories provided a functional structure for data collection and analysis involving communication. Study findings are discussed within the context of opportunities for application design.

INTRODUCTION

Communication is the method by which information is transferred and is essential for all organizational interaction [1]. Understanding communication needs is important for the design of clinical information systems and other interventions aimed to improve operation efficiency and effectiveness [2]. Increasing efficiency and effectiveness of communication has the potential to reduce cost and decrease the risk of medical error. Communication needs in a clinical setting are dependent on a number of factors determined by organizational characteristics. Requirements, the necessary attributes defined for a system, must be carefully identified for the system to have value and utility [3]. Many of the errors in developed systems can be traced to inadequate determination of requirements in the analysis and design phases of the system life-cycle [4]. Consequently, to achieve the potential inherent in the use of technological applications in distributed

environments, we need to understand factors that may change communication needs.

Communication behaviors in clinical settings have been studied through observation [5], self-report logs [6], [7], ethnographic [8], and observational [9] methods. In this paper, we contrast the communication needs of two operating room (OR) suites through observational studies. OR charge nurse communication episodes in two operating room suites were recorded and categorized. We attempt to quantify the differences in communication needs and to associate the differences to those in organizational context and the types surgical cases performed at each site.

The primary goal of OR coordination is to insure the prompt, safe, and effective care of surgical patients. Central to this goal is the OR charge nurse. The charge nurse is integrally involved in insuring that staff, patients, and equipment come together seamlessly to move patients through the surgical process. The Association of Operating Room Nurses (AORN) lists coordination of care for surgical patients as the first item in their outline of the responsibilities of perioperative nursing practice. AORN specifically mentions communication skills as a key component of coordination [10]. Sonneberg advises OR charge nurses to “communicate, communicate, communicate”[11] for successful coordination. Therefore, essential to understanding operating room coordination is an examination of the communication of the OR charge nurse. The purpose of the reported study was to build upon a study previously reported [9] on an OR suite in a trauma center. Specifically, we extended the study in [9] to a general OR suite.

SETTING & SUBJECTS

To contrast communication needs in different OR suites, we collected data in a general OR suite located in a mid-atlantic state. This OR suite was in contrast to an OR suite in a trauma center reported in [9], where only patients experiencing traumatic injury were admitted to the trauma center. Trauma patients gained access

through emergency medical service helicopters or ambulances. The trauma OR suite included six operating rooms, one of which is reserved for patients' requiring immediate surgery.

The general OR suite has nine operating rooms. This operating suite was located in the same city as the trauma OR suite, although, the two suites were not affiliated in any way. Types of surgery performed in the general OR include ophthalmic, gynecologic, dermatologic, neurologic, burn, pediatric, gastro-intestinal, orthopedic, and trauma surgeries. In comparison, cases in the trauma OR suite were generally confined to the repair of open wounds, orthopedic injuries, head injuries, and internal trauma in adult patients.

The Charge Nurse

The charge nurse is responsible for the day-to-day smooth running of OR activities. A charge nurse must coordinate activities in conjunction with the patient admitting and holding area, ambulatory surgery unit, general hospital units, and the post anesthesia care unit. This includes ensuring that the patient is ready for surgery, surgeon is available to perform the surgery and the operating room is cleaned and prepared with the appropriate equipment for the planned surgery, and a competent operating room staff is assigned. Her day begins with reviewing reports on the scheduled cases, the scheduling of patients into specific operating rooms, patient's readiness, staff availability, and any other pertinent information relating to the scheduling of the patients for surgery.

METHOD

Tool design

To capture communication activities of OR charge nurses, each communication episode was categorized according to purpose:

- schedule surgery (e.g. accepting a new case, negotiating time for new case)
- re-schedule surgery (e.g. negotiating a change in case time, canceling a case)
- coordinate staffing (e.g. assign particular staff to case, arrange staff coverage during lunch breaks)
- coordinate room assignment (e.g. assign case to particular room)
- coordinate equipment (e.g. locate the correct equipment for a particular case, direct the preparation of equipment)

- coordinate patient preparedness (e.g. determine if the anesthesiologist has seen the patient, determine if the patient is in the holding area).

A communication episode was defined as an exchange of information between the charge nurse and another person for a single purpose. Additionally, each communication episode was noted to mode (face-to-face, phone, pager or intercom), the target individual, and the duration of the communication. The coding method used in the two OR suites was identical except for the category 'target individual'. In the general OR suite, two additional coding selections were added; 'holding area' and 'bed control'.

Data collection

A registered nurse experienced in operating room procedure, observed the operating room charge nurse and collected data on communication episodes in the general OR suite. Observations occurred during the operating room's busiest time, in the morning. The charge nurse usually remained at the 'desk', which can be likened to a command center. This was where the majority of coordination activities occurred. The area had a telephone with intercom and paging capability. The Charge Nurse occasionally moved away from her 'desk' to assess the progress of a surgery or to discuss room assignment face-to-face with the staff.

When a communication occurred, the episode was coded on the data collection tool, which also captured the duration of the communication. When the observer was unclear about the purpose of the communication or the target person, the information was clarified with the charge nurse.

RESULTS

A total of 700 communication episodes were observed, coded, and recorded on the data collection tool in the general OR suite over 6 non-consecutive days.

Purpose of communication

Coordinating equipment was the most frequent purpose of communication (35.6%), with coordinating patient preparedness, a close second (32.5%) in the general OR suite. In the trauma OR suite scheduling surgery (21.2%) and re-scheduling surgery (11.2%) were the two most frequent purposes of communication. Table 1. shows the frequency percentages associated with each purpose of communication at each observation site.

Table 1. Frequency of communication by purpose in the general OR suite

Purpose	Trauma	General
Schedule	21.2%	3.0%
Re-Schedule	11.2%	4.1%
Staffing	14.7%	13.1%
Room Assign	14.1%	11.5%
Equipment	18.6%	35.6%
Patient Prep.	19.9%	32.5%

Target of communication

In the general OR suite, the target persons of communication were most frequently OR nurses (42.4%), surgeons (13.6%), and the OR clerk (10%). The majority (52.5%) of communications were face-to-face, then by phone (33.1%), and intercom (13.3%). These data are similar to those collected in the trauma OR suite, except for the frequency of communication with floor nurses and the use of the intercom as a mode of communication. Charge nurses in the trauma OR suite communicated more frequently with floor nurses (13%) than those in the general OR suite (4.7%). Conversely, charge nurses in the general OR suite were more likely (13.3%) to use the intercom as a mode of communication than charge nurses in the trauma OR suite (2%).

Duration of communication episodes

The duration of the communication episodes ranged from 10 seconds to 5 minutes in the general OR suite with a mean of 37 seconds and from 10 seconds to 10 minutes in the trauma OR suite with a mean of 73 seconds. Communication episodes were relatively short at both sites, in the general OR suite 94.7% of the communication episodes were one minute or less in duration as compared to 80.8% of communication in the trauma OR suites.

Relationship between communication mode and target of communication

There was a relationship between the target person of the communication and the purpose of the communication (Chi Square, $p < .001$). For example, 60% of communication with OR technicians was to coordinate equipment, while 88.5% of communications with the ambulatory surgical unit were to coordinate patient preparedness. Table 2. lists the most frequent target person of communication by the most frequent purpose of the communication.

Table 2. Target of communication by most frequent purpose in the general OR suite

Target	Purpose
OR Nurse (34.3%)	Equipment
Surgeon (31%)	Patient Preparedness
OR Technician (60%)	Equipment
OR Clerk (33%)	Patient Preparedness
Equipment Mgt. (88.5%)	Equipment

This same relationships was found to be significant in the data collected in the trauma OR suite, however the character of this relationship was substantially different. Table 3. lists the most frequent target person of communication by the most frequent purpose of the communication in the trauma OR suite.

Table 3. Target of communication by most frequent purpose in the trauma OR suite

Target	Purpose
OR Nurse (31%)	Staffing
Surgeon (43%)	Schedule Surgery
Floor Nurse (50%)	Patient Preparedness
Equipment Mgt. (96%)	Equipment
Anesthesia (38%)	Schedule Surgery

DISCUSSION

Effect of organizational characteristics

Scheduling patterns

In the trauma OR suite, scheduling and re-scheduling surgery accounted for more than 32% of the communication episodes. These same communication categories only composed 7% of the total communications in the general OR suite. Accommodating emergency cases is a frequent occurrence in the trauma OR. In addition, surgeons there scheduled non-emergency cases the same day of surgery as their schedule allowed. The overriding organizational goal of providing immediate trauma care resulted in recurrent changes to the surgical schedule and the necessity of the charge nurse to negotiate each of these changes. Conversely, scheduling and re-scheduling surgery constituted only 7.1% of the communication episodes in the general OR suite. In this environment emergency surgeries must also be accommodated, however, most surgeries are scheduled up to two weeks in advance, resulting in fewer changes to the surgical schedule.

Variation of cases

The most frequent reason for communication in the general OR suite was to coordinate equipment (35.6%), this same category only accounted for 18.6% of the total communication episodes in the trauma OR suite. We propose two possible explanations for this discrepancy: 1. there was more variation in the types of surgeries conducted in the general OR suite, and 2. operating rooms in the trauma OR suite were stocked with the standard equipment necessary for most trauma cases. Cases conducted in the general OR suite include, but are not limited to, ophthalmic, gynecologic, dermatologic, neurologic, burn, pediatric, gastro-intestinal, orthopedic, and trauma surgeries. Cases conducted in the trauma OR were generally confined to the repair of open wounds, orthopedic injuries, head injuries, and internal trauma in adult patients. Greater variation of cases requires a greater inventory of equipment that must be processed, tracked, repaired, and distributed to rooms according to the type of case. Less case variation allows the trauma OR to stock each room with standard equipment for the limited types of surgeries performed.

The combined effects of differences in scheduling patterns and case variations can explain the significant difference ($p < .001$) in duration of communication between the two OR suites. Overall, communications in the general OR were much shorter (mean=37 seconds) than communications in the trauma OR (mean=73 seconds). Communication episodes at both sites that were the longest in duration were scheduling surgery and coordinating staffing, episodes that were the shortest in duration were coordinating equipment and coordinating patient preparedness. Consequently, with more frequent communication in the area of equipment and preparedness, the general OR suite had shorter overall communication. Conversely, with more frequent communication in the area of scheduling surgery, the trauma OR suite had longer overall communication. Coordinating staffing and scheduling required longer communications because these communications often involved negotiation between the charge nurse and nurses or surgeons. On the other hand, coordinating equipment and coordinating patient preparedness were generally information seeking or information disseminating in nature resulting in their shorter duration.

Effect of patient characteristics

The second most frequent reason for communication in both the general OR (32.5%) and the trauma OR (19.9%) was to coordinate patient preparedness. Generally, this was to establish if the patient was ready for the OR or if the OR was ready for the patient. Communication in this category generally related to tracking the patient's location throughout the hospital or tracking the patient throughout the preparation process. Prior to surgery, financial forms, admission assessments and diagnostic testing must be completed. In addition, their surgeon and anesthesiologist must examine patients before surgery can be initiated. This process was observed to be essentially the same in each hospital.

However, tracking the patient through the hospital comprised a greater number of communications in the general OR suite. Most patients scheduled for surgery in the general OR suite were admitted to the hospital the same day as their surgery. Patients were admitted to the hospital through the ambulatory surgery unit where their preparation begins. From ambulatory surgery they moved to a holding area, then to the OR, the post-anesthesia recovery unit (PACU), then either back to ambulatory surgery for discharge or to an inpatient hospital unit. A great deal of time was spent determining where the patient was located along this route. The majority of surgical patients in the trauma OR suite were either located in an emergency care area adjoining the surgical suite or were already admitted to an inpatient hospital unit, resulting in less communication related to patient tracking.

SUMMARY

Tools, such as wireless devices and computerized communication mechanisms, may enhance OR suite efficiency and effectiveness. Our comparison of two OR suites suggests that although both study sites were operating rooms, differences in overall organizational and patient characteristics resulted in different patterns of communication. Solutions that may work for one type of OR suite may not work very well for other types of OR suites due to these and other differences. On the other hand, similarities between the two sites on the categories of equipment coordination and patient preparedness, suggest opportunities for improvement in efficiency that could be achieved regardless of organizational differences.

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