

Team Communications in the Operating Room: Talk Patterns, Sites of Tension, and Implications for Novices

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ABSTRACT

Purpose. Although the communication that occurs within health care teams is important to both team function and the socialization of novices, the nature of team communication and its educational influence are not well documented. This study explored the nature of communications among operating room (OR) team members from surgery, nursing, and anesthesia to identify common communicative patterns, sites of tension, and their impact on novices.

Method. Paired researchers observed 128 hours of OR interactions during 35 procedures from four surgical divisions at one teaching hospital. Brief, unstructured interviews were conducted following each observation. Field notes were independently read by each researcher and coded for emergent themes in the grounded theory tradition. Coding consensus was achieved via regular discussion. Findings were returned to insider “experts” for their assessment of authenticity and adequacy.

Results. Patterns of communication were complex and socially motivated. Dominant themes were time, safety and sterility, resources, roles, and situation. Communicative tension arose regularly in relation to these themes. Each procedure had one to four “higher-tension” events, which often had a ripple effect, spreading tension to other participants and contexts. Surgical trainees responded to tension by withdrawing from the communication or mimicking the senior staff surgeon. Both responses had negative implications for their own team relations.

Conclusions. Team communications in the OR follow observable patterns and are influenced by recurrent themes that suggest sites of team tension. Tension in team communication affects novices, who respond with behaviors that may intensify rather than resolve interprofessional conflict.

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Currently, health care teams are the nucleus for both the care of patients and the clinical education of novices (students and residents). As an educational

community, we know relatively little about how the experience of being part of a health care team shapes a novice’s learning. And, although we may suspect that the communication within teams is important to both the team’s dynamic and the novice’s developing professionalism, we have yet to document the nature of such talk and its educational influence. This paper begins the exploration of the nature of team communication, particularly communication within the operating room (OR) team, and its influence on the socialization of health professional novices.

The OR team is a diverse system. It has staff and trainees from three health

care professions (surgery, anesthesiology, and nursing) and intermittent representation from radiology or pathology staff. While an implicit hierarchy governs the team, interactions among OR team members are not as clearly structured as in analogous, high-intensity professions such as aviation, where communication protocols exist for most recurring scenarios. The combination of diverse medical cultures and ambiguous team relations makes effective communication in the OR a challenge.

The need for research in team communication in the OR is evident because survey studies^{1,2} and anecdotal reports offer negative depictions. Al-

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though the stereotype of ineffective interprofessional communication is not specific to the OR,³ communications there are known for their purportedly autocratic, top-down, militaristic nature. Representations in popular culture, such as the television productions of *ER* and *Chicago Hope*, reflect the myth—the caricature, perhaps—of overtly combative discourse between surgeons and the OR team. Further, the subject has received recent attention and prominence in the surgical profession,⁴ and one study showed that health care workers in the OR stereotyped the surgeon as unsophisticated in interpersonal relations.²

These are largely editorial and anecdotal opinions. Novices enter the domain wincing in anticipation of a negative dynamic, and surgeons poke fun at themselves as minimal communicators. Rigorous research is required to explore the origins of the myth of ineffective communication within OR teams to assess its accuracy and influence and to provide a systematic record that can facilitate appropriate and effective educational efforts.

This study explored the nature of communications among OR team members from surgery, nursing, and anesthesia to identify common discourse patterns and sites of tension and to investigate the implications of tension for novices. It was not our intention to make claims about whether tension in the OR is good or bad, or whether it should or should not exist. Rather this study was intended to increase our understanding of what tension in the OR looks like, when and where it manifests itself, how team members respond to its presence in their communication activities, and what its implications are for novices. Armed with such knowledge, we can better shape faculty development and education programs.

Literature Review

No study in the literature *directly* addresses communication in the interdis-

ciplinary relations of an OR team. This has made it difficult, to date, to assess the myth of OR team communications. However, a set of related and overlapping research domains can inform our approach to this new area of investigation.

Researchers from anthropology, the humanities, and rhetoric have found medical teams a rich research site for studying physician–physician and interprofessional communication. Such studies have revealed that talk among physicians delivers patients' information from one provider to another and is essential in the negotiation of professional relationships, the distribution of responsibility, the inducement of cooperation, and the assessment of competence. Those who “talk the talk” are assumed to be clinically and socially competent.^{5–7} Not surprisingly, learning such talk has been found to be a strong socializing force in the training of novice physicians.⁸

Research into health professionals' relationships shows discord and disagreement among disciplinary groups. One survey study revealed an absence of consensus between physicians and other health care professionals (nurses, social workers, etc.), particularly with regard to issues of teamwork, communication, and patient care.¹ Much of this literature focuses on the tension between physician and nurse.^{9–11} It tends, however, to offer broad characterizations of issues rather than systematic examinations of activities.

Research on OR communications is sparse. Fox presents a sociologic analysis of the activity of OR teams, largely from the point of view of anesthesia and without detailed analysis of communication patterns.¹² Pettinari's analysis offers an exploration of how the activity of the surgical team is represented in the operative report.¹³ Her study, however, does not consider communications outside the surgery subgroup of the OR team, nor (because of its focus on written text) does it attempt to understand the meaning of operation talk for par-

ticipants. The single study to consider both OR team cooperation and communication issues is a quantitative analysis of decisions to transfuse blood,¹⁴ which examines the frequency and outcome of discourse regarding transfusion practice and suggests the hierarchy of decision making between surgeons and anesthesiologists. However, it does not examine the motivations and interpretations of the various communicative events recorded.

Another related research domain is that of organizational performance. In medicine, much performance research focuses on the nature and explanation of human error. Researchers have analyzed the performance of anesthesiologists,^{15,16} the coordination between anesthesiology and surgery,¹⁷ and the performance of the OR team.² In the latter study, surveys of 156 OR team members representing surgery, nursing, and anesthesiology revealed a perceived need for better communication to increase efficiency and improve team morale. Observations of procedures in the ORs revealed numerous errors related not to technical competence but to the interpersonal aspects of the ORs' functioning.

Theoretical Approach

This study is informed by a rhetorical theory of communication as a social act.¹⁸ A fundamental principle of rhetoric is that all communication has effects—intended and actual. Similarly, communication is motivated by the need to identify with an audience in order to overcome difference and achieve the common ground required for a productive exchange.¹⁸ Forging such identification requires recognition of the elements of division and negotiation of shared interests.¹⁹

In some communicative settings, the divisive factors may be especially numerous or intensive, as in cross-cultural contexts or labor relations. Because of its interdisciplinary nature, the OR team is beset by divisive elements, including gender, economics, politics, and

professional models of care. Such a host of divisions provides fertile ground for communication to go awry, for motives to be in conflict, and for messages to have unintended effects. When communication does derail, its effects expand beyond the words themselves. Words act on us; they both make possible and constrain our understanding of our lives. To look at communication this way enables an analysis of communication problems and their impact on social activity.

METHOD

Informed consent was obtained from all participants and approval for the study was obtained from the University Health Network Research Ethics Board.

Data Collection

Over a four-month period in 1999, paired researchers jointly observed 128 hours of OR interactions representing 35 procedures from four surgical divisions (general surgery, urology, otolaryngology, and cardiac surgery) at one teaching hospital. These four divisions were selected based on preliminary data collection (observations and informal interviews with nurses and surgeons) that suggested they might reflect a range of team communication styles and thus allow for triangulation of data. To gain experience in OR dynamics before formal observations commenced, the researchers observed for two days without recording formal notes.

The sample was designed to yield data on the range of communicative patterns in the OR setting rather than a detailed analysis of the communicative styles of particular individuals. Therefore, a large sample population with limited observations per individual was sought. Observers attended procedures where participants were surgeons ($n = 15$), nurses ($n = 28$), anesthetists ($n = 10$), and novices (third-year students to senior residents, $n = 30+$). The observers independently recorded

communication-related activities using standard ethnographic field-note techniques²⁰ and conducted brief unstructured interviews (approximately two per observation) that solicited participants' opinions of the representative nature of the observed activity. Mechanisms to minimize observer effect (the potential that participants will alter their usual behaviors in an observer's presence) included observation length (three to five hours for most sessions) and duration (one month per division).

Data Analysis

Field notes were analyzed to construct a qualitative schematic of team communication in the OR. Following standard procedure for inductive analysis, three researchers individually read, coded, and analyzed the field-note data, after which group discussions were held to resolve minor coding differences.²¹ Differences were negotiated by referral to the field notes and by soliciting insider perspectives from working-group members. The working group consisted of the study's authors, in particular the principal investigator (LL) and the representatives from surgery, nursing, and anesthesia. All "communicative events" were identified and their contexts, participants, and contents were described. A communicative event was defined as a verbal or nonverbal exchange with two or more participants. Events were coded according to recurrent themes and organized according to their apparent levels of tension. Tension level (categorized as "none," "lower," or "higher") was determined individually by two researchers who assessed content, nonverbal cues, tone of voice, use of repetition and emphasis, and apparent outcomes of the exchange. Minor discrepancies were resolved by enlisting a third researcher to individually code these events for tension level.

A sample of data coded for theme and tension was presented to the members of the working group. The sample was discussed from the perspective of

each discipline (nursing, surgery, and anesthesia) to confirm the representative nature of the data and to challenge and expand the coding analysis. Coded data were then entered into a qualitative data-analysis software program and further analyzed for thematic interrelationships.

RESULTS AND DISCUSSION

Communication Patterns and Sites of Tension

Our observations captured a diverse range of communicative events, including jokes, stories, commands, questions, social chat, rebukes, and silences. Communicative events varied significantly in terms of duration, complexity, and participants, ranging from cryptic question-and-response sequences to detailed discussions lasting many minutes and engaging various numbers of speakers and listeners. Field notes from some procedures reported as few as 20–30 communicative events, while others reported over 100 events. Variables influencing such diverse distribution may include the type of procedure and the nature and relationships of team members. Not surprisingly, observed events tended to cluster around phases of activity in the OR: patient preparation, commencement of procedure, moments of difficulty or teaching in the procedure, conclusion of procedure, and patient changeover.

Prominent themes around which observed communicative events clustered were

- time (room turnover, patient cancellation, sending for the next patient),
- resources (equipment allocation and distribution, personnel distribution),
- roles (responsibilities, constraints) and relationships,
- safety and sterility (aseptic technique), and
- situation control (temperature regulation, recording activities).

Communicative tension arose regularly in relation to these themes. All 35 observed procedures contained between one and four higher-tension events. The higher-tension level occurred particularly when tension extended beyond the content, participants, and context of its original occurrence. Such tension spread to other team members; other contexts such as adjoining operating rooms, the front desk, or the scrub room; and other topics of conversation or content areas.

In our data, higher-tension events occurred most often between surgical and nursing staff. While tension between surgeons and anesthesiologists has been reported,¹² this phenomenon is not dominant in our data, perhaps because very little communication of any kind was recorded between these individuals in the procedures we witnessed. Whether this is a function of the types of procedures observed or the divisions selected for observation, the culture of the teaching hospital in which the research was conducted, or some other variable (such as a current shortage of anesthesiologists), we do not know.

Is the Myth Accurate?

In contrast to the prevailing myth of an autocratic, militaristic communication system in the operating room, our data suggest that there is in fact a wide range of subtle communications among members of the OR team, particularly in situations of tension or potential tension.*

*This is not to say that such stereotypical communications were not witnessed: they were, but as one part of a larger, more complex communicative system. Because the presence of observers in the OR may have decreased the number of stereotypically militaristic exchanges, we inquired in informal interviews about the representativeness of the day's activities. For the most part, participants indicated that activities during observed exchanges were not substantially different from those in non-observed exchanges. When a report of non-representativeness was received, the data for that period of observation were discarded. This occurred in only two observation sessions.

For instance, when surgeons and nurses discussed issues of time—patient scheduling, sending for the next patient, cancellation of cases, room turnover, etc.—they accessed many types of discourse: questions, commands, stories, jokes, rebukes, statements, and nonverbal signals (nodding, gesturing, facial movements such as eyes rolling). Access to this variety continued across tension levels, suggesting that tension level did not predict or constrain the type of discourse. For example, when a surgeon wanted the circulating nurse to send for the next patient, she or he was more likely to use a question or a statement than a command to achieve this goal. The difference is important because it is the difference between *asking* and *ordering* other team members in an effort to persuade them to action. And, although the “social and symbolic action”²² may be the same—getting other team members to do what the surgeon wants—the communicative strategies are far more delicate than the stereotype of the shouting, demanding surgeon would suggest. The range and flexibility of discourse strategies—using a joke to hasten a procedure or telling a story to cajole the circulating nurse into finding a preferred piece of equipment—indicate a complicated “dance” that maintains relationships and minimizes tension while still achieving goals.

Communicative Tension and Its Implications for Surgical Novices

Although we did not find OR team communication to be combative in the stereotypical ways, tension recurred in the operating room. The interprofessional communication patterns created out of this tension are often transmitted to novices in ways that may have implications for their socialization.

Of the one to four higher-tension events observed per procedure, novices tended to be involved in about one third. In response to team tension, we observed that surgical novices repeat-

edly invoked either of two visible behavioral alternatives: mimicry of the teacher's discursive style or posture and withdrawal from the communicative sphere.

A third behavioral alternative—intervention in or redirection of the communication—is possible, but we did not observe any novices choosing this option, possibly as a reflection of their vulnerable status as learners in the OR setting. Although both withdrawal and mimicry behaviors were recurrent, withdrawal was more common as a novice's response in higher-tension situations, as it was also in lower-tension situations (e.g., the novice walking away from the surgeon and anesthesiologist as they are discussing their frustration with a staff colleague). In lower-tension situations, the behavior of withdrawal may have been a response to the awkwardness of private conversations held in public spaces. In no-tension situations, withdrawal was more difficult to characterize because it required the novice's visible self-removal from the communicative sphere. Without a recognizable tension prompt, observers may have been unable to distinguish between strategic withdrawal and withdrawal as part of the common ebb and flow of individual participation in social discourse. As a result of this difficulty, the field notes may more accurately reflect instances of mimicry than instances of withdrawal, especially during lower communicative tension levels.

To elaborate on the trainees' responses to team tension, consider the following two representative examples from the field-note data.

Behavior 1: mimicry.

During a procedure in general surgery, the staff surgeon has been requesting instruments at a furious pace. Many of the requested instruments that have been passed by the scrub nurse are still resting, unused, on the draped patient.

The circulating nurse (CN) has left the room twice to seek out additional

instruments requested by the staff surgeon. Both nurses are visibly frustrated. The circulating nurse comments to one of the observers under her breath: "Oh, he'll ask for anything he can think of, but he won't use the half of them. You watch. It's just about being able to ask."

Later in the procedure, the junior resident (PGY-2) is allowed to try his hand at laparoscopic technique. His back is to the video screen on which the camera is projecting an image.

PGY-2: "Is there not another monitor?"

CN (her head snapping around): "Who's asking for another monitor?"

PGY-2: "I'm used to . . ." (he gestures that he'd like a monitor facing him too—the current monitor faces the PGY-4).

PGY-4 interrupts PGY-2 and pulls his gesturing hands down.

PGY-4 to CN: "Nobody is requesting another monitor!"

CN: "Not Dr. NEW fellow? He's not requesting anything, is he?"

Laughter all round.

In this example, the PGY-2 mimics the staff surgeon's interaction with the nursing staff. He too, requests instruments that are not present in the room, and he does so in an imperious tone, insinuating that there ought to be another monitor available. The novice here purposefully adopts the surgeon's posture—either oblivious to or uncritical of the tension that it has evoked in the nursing staff. As this example illustrates, a novice's mimicry often involves attitude and tone of voice, as well as particular wordings. In cases such as this one, mimicry of tone and attitude can trigger chastising from other team members, which may further escalate the tension.

The nurse's chastisement suggests the nature of the PGY-2's error. Acquired status and power (though still tension-provoking) allow the staff surgeon to make his frequent resource requests. The novice's relative status on the team makes mimicry of these activities a dangerous strategy. The senior resident ob-

viously recognizes this. But nothing is explicitly said to the junior resident, and it is not clear that he understands what has transpired. In fact, this trial-and-error learning may reinforce professional stereotypes (such as "the nasty nurse") rather than teach communicative subtleties or effective interprofessional relations.

In the second event (below), prior to the staff surgeon's entrance, the atmosphere in the ENT operating room is collegial. The junior and senior residents are helping the circulating nurse prepare the patient and discussing the weekend, lunch choices, past procedures.

Behavior 2: withdrawal.

The surgical fellow arrives.

Fellow to CN: "We still need a headlight in here whenever you're ready."

CN: wheels in a headlight.

Fellow: "Not that one—the other one."

CN: "It's in the other room."

Fellow: "Well, can we get it?"

CN: "I'll ask."

. . . a few minutes pass. The staff surgeon enters and a discussion ensues about how equipment gets "borrowed" by other divisions and can't be found. The staff surgeon tells the CN "you should do something about this." After a few more minutes:

Fellow asks CN: "They [the surgeons in the next OR] using the headlight?"
CN (clearly exasperated): "Yes, they're using it."

Staff surgeon to fellow: "What's wrong dear?"

Fellow: "I want the blue headlight."

CN: "[Staff surgeon next door] is using it."

Staff: "What procedure is he doing?"

CN responds.

Staff: "He needs the headlight for that?"

CN: "You can ask him if you want."

More time passes.

Staff: "We're operating by candlelight over here."

CN leaves and eventually comes back with the blue headlight.

During this exchange, the surgical trainees who had been involved in discourse with the nurses beforehand have withdrawn from the communicative sphere. Once the procedure ends and the staff surgeon and fellow have left, the junior resident attempts to resume conversation with the nursing staff. In response, the circulating nurse and the scrub nurse roll their eyes at one another. As the resident talks to her, the circulating nurse exits with the blue headlight in her hand.

In this example, the relationship between the surgical novices and the nurses is impaired as a result of the long and increasingly tense "blue headlight" exchange. The novices opt to stay out of this tense discourse, but they are condemned by association. The roles established by the tense exchange do not dissipate when the players exit. Instead, the novices are unable to cast themselves differently in the eyes of their nursing colleagues.

Implications of the Method

In addition to the novices' behaviors we witnessed, novices may have experienced less visible responses to team tension, responses that are not accessible using observation by a non-participant as the method of data collection. For instance, the novices may have formed attitudes about their own or other disciplines by witnessing tension and its handling among other team members. OR team tension may have had an impact on the novices' technical skills during a procedure, a response that might not be recognized by non-surgical observers. These responses are addressed in the next phase of our research, which uses focus-group methods to probe participants' interpretations of and reactions to team tension.

In any observational study, the question of authenticity of data is of central

concern. In addition to mechanisms employed to minimize the Hawthorne effect, the observers were instructed to record evidence of possible Hawthorne effect in their field notes (e.g., participants speaking to observers) and, in discussions following the day's observations, the researchers determined whether any data ought to be discarded as tainted. Furthermore, informal interviews with randomly selected participants following each observation period contributed to our sense of the data's representativeness and informed decisions to discard unreliable data. Finally, working-group members commented on whether data seemed representative or not; in only two instances did these experts question the quality of the data. Due to these measures, we are confident that the findings reported in this study reflect representative team communication activities specific to the hospital studied, the time of year in which observations were conducted (August–December), and the nature of the divisions selected for study.

CONCLUSIONS

Our findings suggest that communication among OR team members is more subtle and complex than the openly combative style that is the stuff of OR myth. In fact, the patterns of communication observed in this study reflect strategies for achieving goals while minimizing tension and maintaining social cohesion. Team members' use of multiple discourse types across situations with varying tension levels suggests a complex dance among discursive players. This dance deserves further investigation, both in terms of exploring its rhetorical "moves" and in terms of articulating how these moves are learned, refined, challenged, and discarded. As a dynamic social entity, the OR team and its language practices are not static; they are subject to social, political, ec-

onomic, and cultural influences. Documentation of how such variables shape communication would assist in the development of effective continuing educational initiatives in this domain.

Our findings also illustrate that the interprofessional communication patterns associated with tension can be transmitted to novices, whether they accept these imprinted patterns and roles or explicitly try to avoid them. That social discourse can shape a novice's development is a key principle of educational theories of "situated learning" and "socially shared cognition."²³ Fundamental to these theories is the understanding that individuals often learn as members of groups in particular social situations, and that the acquisition of discourse is a vehicle for the acquisition of sociocultural values and attitudes. Words act on us: ways of speaking shape ways of knowing and being in the world. Thus, if we are looking for reasons why relations among OR team members are not improving with new generations at the rate that educators would like, the implicit curriculum embedded in team communications may be worth our attention.

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