

**Team communication failure in operating
rooms: Preliminary findings from an observational study**

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Team communication failure in operating rooms: Preliminary findings from an observational study

This paper discusses preliminary findings of an observational study of team communication failure in operating rooms (ORs). The study intended to replicate previous research in which the focus was on type and frequency of communication error. However, we expand on this research by using an organisational behavioural framework to explore why such errors may occur. OR teams are complex as they are characterised by clearly defined hierarchical and clinical roles, and divergent zones of communication, creating natural team 'imbalances'. We suggest that exploration of teams within OR settings can provide insight into the organisational behaviour intricacies that emerge from the intersection of roles, power and subcultures in complex organisational environments where human error has the potential to create catastrophic consequences.

Keywords: Communication error; teams; operating rooms; observation

Researchers have suggested that effective communication is essential for organisational and administrative success (Garnett, Marlowe, & Pandey, 2008, p. 266). However, as argued by Gelders, Verckens, Galetzka & Seydel (2007: 171) 'the...context in which organizations communicate is scarcely considered'. This suggests that while management theory and practice may focus on determining efficiency in terms of people and processes, exploration of how this impacts on communication - and also, how communication impacts on the organisation and its functioning - is worthy of further consideration.

In this paper we focus on team communication within an operating room (OR) environment and highlight some initial findings of an observational study currently being conducted in an urban and regional hospital site. As the research is ongoing, this paper explores some of the findings of observations that took place within the urban hospital setting only. The primary aim of the overall research is to replicate a study conducted by Lingard et al. (2004a), which explores how problems surrounding team communication can contribute to errors that potentially impact on the quality of patient care. The original study conducted by Lingard et al highlights a number of pre-determined categories of communication error such as problems surrounding the use of time and space, inaccurate information exchange, or exclusion of key members of staff in the communication interaction. Our observational study also explores these errors and their potential consequences. While Lingard's work provides valuable insight

into the nature of communication error within the operating room environment, we believe that further value can be added by expanding the research to explore *why* communication errors occur within ORs so that an understanding of some of the issues that cause communication error within this setting can be uncovered. As we conducted observations and began to reflect on the data we were collecting; it became evident that instances of communication failure were closely linked to the behaviour of individual team members, which contributed to poor teamwork and thus the ways in which members of the OR team communicated with each other. This paper describes and details some examples of the communication errors observed throughout the process of data collection so far, before theorising about these within the contexts of team composition and organisational behaviour (OB) more broadly. In addition to extending current research on communications within the context of the operating theatre, we also aim to provide staff working within ORs with a better understanding of OB and management issues more generally and how these impact on performance within the operating room.

TEAM COMMUNICATION IN OPERATING ROOMS

Recognition of the importance of effective communication is acknowledged in the patient quality and safety literature as researchers attempt to unlock the characteristics of positive and negative communication to develop methods for improving patient care (Lingard et al., 2004a; Lingard, Reznick, Espin, Regehr, & DeVito, 2002a). Evidence suggests that adverse events occur at unacceptably high rates within inpatient settings and that ineffective team communication is frequently at the root of medical error (Lingard et al., 2004a). Research conducted by Lingard et al. (see for example Lingard et al., 2004a; Lingard, Garwood, & Poenaru, 2004b; Lingard, Regehr, Espin, & Whyte, 2006; Lingard et al., 2002a) led to the development and testing of a theory-based instrument for evaluating team communication within the OR environment. The instrument was aimed at exploring the 'rate of communication failures displayed per procedure, classifying the type of communication failure...and identifying the consequences of that communication failure for a team functioning in an operating room,' (Lingard et al., 2006: 426). A limitation of this study lies in the safety focus in which the emphasis is placed upon *what* happens in terms

of communication failure, how often this occurs and what the consequences of the communication failure are. We argue that observing team communication within an OB framework – in which the attitudes and/or actions of individuals and groups and how these impact on the overall functioning of the organisation are at the forefront- has the capacity to expand on such studies, especially as there is recognition in the medical literature that human factors can play a significant role in non-technical errors in surgical environments (Catchpole et al., 2008; Way et al., 2003). Within the Australian setting, OB has been used as a framework for understanding how decisions are made within the context of scheduling emergency surgery (Fitzgerald, Dadich, & Lum, 2007; Fitzgerald, Lum, & Dadich, 2006) and we argue that such studies have much to contribute to the medical .As Lingard et al. (2004a) highlights, communication within the OR is frequently reactive and ad hoc leading to delay, inefficiency and lack of effectiveness in team operation. The failures that this provokes are based in strikingly simple factors such as: ‘communication is too late to be effective, content is not consistently complete and accurate, key individuals are excluded, and issues are left unresolved until the point of urgency’ (Lingard et al., 2004a: 330). Dreachslin (1999: 257-258) found a number of behaviours that are typically associated with poor communication within the patient care context. For example, team members who ‘give orders rather than make requests, engage in one-way rather than two-way communication...exhibit unpredictability in mood or behaviour, or consider themselves superior to other team members’ were attributed to poor functioning of the overall team.

In viewing team communication in ORs from an OB approach, it is important to consider why behaviours such as those explored by Dreachslin (1999) might occur. OR teams can be considered as highly interdependent task-based teams in which a successful surgical procedure ‘requires extensive interaction among group members to generate the collective output’ (Wageman & Gordon, 2005: 687). Each OR team typically consists of surgeons, anaesthetic staff, nursing staff and theatre technicians, all of whom play a specific role that contributes to the overall functioning of the OR. Although team members are arguably highly interdependent, there are different skills and qualifications required to perform each of the roles within the OR, which have the capacity to influence overall team communication. For example,

Sutcliffe, Lewton & Rosenthal (2004) suggest that each professional group is positioned at various levels of the medical hierarchy, thus impacting on the nature of communication between staff. Exploration of relationships between residents and nursing staff, attending physicians and specialists revealed that communication can be distorted due to fear, intimidation, or 'because of concerns about offending the more powerful party' (Sutcliffe et al., 2004: 191).

Sutcliffe et al's (2004) research clearly indicates that power between professional groups can play a role in how each interacts with and ultimately communicates with the other. den Otter and Emmitt (2007) also argue that differences in professional groups impact on the effectiveness of team communication however, do so from an organisational culture perspective, which emphasises shared assumptions across those within an organisation. They suggest that members of multi-disciplinary teams come into the team from specific organisational cultural backgrounds, which are likely to impact on the way that each is used to communicate. They add that it is therefore important that team leaders 'facilitate, stimulate and motivate their members to communicate effectively as a team' (den Otter & Emmitt, 2007: 409). Within the OR settings we have observed, it is arguable that all individuals come from the same organisational culture as they are members of the operating environment within the larger organisations. However, individual team members within ORs have distinct tasks that are shaped by professional values and therefore different subcultures, which may influence performance and behavioural expectations (Boisnier & Chatman, 2003).

In addition to value and subcultural differences associated with each professional group within the OR, it is highly likely that individual roles within the OR impact on overall team functioning and effectiveness. Senior (1997) suggests that individuals become members of teams on the basis that they have expertise in a particular task or function. Leung, Chan and Lee (2003: 85) then highlight that the success of a team relies upon 'a complementarity of characters to match the mission of the team' stressing the individual but complementary nature of team roles. There has been significant discussion within the management literature about team roles and how they contribute to team balance and high levels of performance. For example, Belbin's (1981, 1993) widely cited research on team roles indicates that

specific roles are required for management teams to achieve optimal performance. Belbin's work has been criticised for being too managerial in focus (see for example Fisher, Hunter, & Macrosson, 2002; Higgs, 1999) and as researchers have made attempts to apply it in non-managerial contexts, discussion of the notion of team balance more broadly has developed. While there appears to be agreement within the literature that particular roles are important for teams to be balanced (for example Fisher et al., 2002; van de Water, Ahaus, & Rozier, 2008), Leung et al. (2003: 84) suggest that there are situations in which all members of teams cannot be present and that 'team members autonomously supplant the roles of missing members' to try and maintain balance. However, Senior (1997: 242) suggests that the link between team roles and performance is more complex arguing that expertise in a role does not assist people in 'matters such as the way different team members...interact with one another, or their style of behaviour in general'. Manning, Parker and Pogson (2006: 288) indicate that from a sociological perspective, individual team roles and how 'people see themselves will depend, in part at least, on the social positions that they habitually adopt, and on what is expected of them in such positions', indicating that hierarchical positioning within organisations may also impact on roles, balance and performance. Throughout the remainder of this paper we theorise about how some of these aspects of team composition could affect communication with ORs.

METHODS

As noted above, the project on which this paper is based sought to replicate research conducted by Lingard et al. (2004a; 2006) on team communication failures in ORs. This research utilised observation as a method of data collection. Based on many hours of observation, Lingard et al. (2006) developed a theory-based observation template drawing upon four communication categories taken from rhetorical theory: occasion (problems of timing), content (communicative exchanges that contain incomplete/inaccurate information), purpose (posing of a question to another team member that remains unresolved), and audience (situations in which a communication exchange excludes a key person). Our project used these categories to assist in guiding our observations and in identifying instances of communication failure.

Observation is widely recognised as an important method of qualitative inquiry and provides particularly relevant insights into how organisations function (Silverman, 2001: 54). This is illustrated in the growing body of research that uses observational methods to examine team communication and reporting in clinical settings (see for example Catchpole et al., 2008; Catchpole et al., 2007; Lingard et al., 2002a; Riley & Manias, 2006; Yule, Flin, Paterson-Brown, & Maran, 2006). As a method of data collection, observation is located within an ethnographic approach to social inquiry which aims at gaining a detailed understanding of the culture and social interactions among actors within a particular setting. To develop this understanding, observation, ‘entails the systematic noting and recording of events, behaviors, artifacts (objects) in the social setting chosen for study’ (Marshall & Rossman, 2006: 98). Typically observation occurs in ‘natural settings’ where actors are engaging in activities which are typical of that setting. Nevertheless, this does not mean that observation is value-neutral and objective. It has long been recognised that observers have an effect on what they observe (Angrosino, 2005). Indeed, in industrial and medical settings it has been found that if participants know they are being studied they are likely to alter their behaviour potentially creating a ‘Hawthorne effect’ (McCarney et al., 2007). Rather than a source of bias, acknowledging explicitly the observer’s position in the social setting is a crucial part of describing and understanding that setting. In addition, the ‘postmodern turn’ in ethnography recognises that it is not possible for the observer to establish an objective truth about a culture or organisation. As Angrosino (2005: 731) argues, ‘it may be neither feasible nor possible to harmonize observer and insider perspectives so as to achieve a consensus about “ethnographic truth”’. Therefore, the observer must be attentive to difference and discontinuity rather than attempting to reach a singular truth about what ‘really’ happened.

The project involved observations of communication as part of vascular and general surgical procedures within an Australian public teaching hospital. The hospital has eight ORs and is staffed seven days a week, 24 hours a day. It caters to both elective and emergency procedures as well as encompassing a range of surgical specialties, with the exception of trauma. The objective of the research is to observe a total of 30 procedures with an even split between vascular and general procedures. Based on previous work by Lingard et al. (2006), 30 procedures was deemed sufficient to evaluate reliably the main types,

and consequences, of communication failures being observed. At the time of writing, 20 observations had been conducted, with two-thirds of these vascular surgical procedures. Where possible, observation of the procedures was viewed by two observers at a time and records of events observed, including communication failures, were completed independently by each observer.

Our preliminary analysis of the data was guided by Lingard et al's (2006) four communication categories with particular attention paid to: (1) the total number of events (defined as failure of communicative exchange between or among members of the surgical team) across all procedures, (2) the total number of events per procedure and (3) the intra-procedural classification of events as noted by the observers. However, as we continued to conduct observations, and to reflect on the data that we were collecting, it became evident that instances of communication failure were linked closely to issues pertaining to team composition. We found that these have an impact on the likelihood of communication error occurring and discuss this within the remainder of this paper.

INITIAL FINDINGS

Although we are broadly concerned with *why* communication errors may occur within the OR environment, it is important to provide some examples of the nature of communication errors we have observed to provide context for our discussion. These are highlighted as follows:

1. An example of communication error in the form of an audience error was observed when a scout nurse left the OR without informing any of the nursing staff and did not return for the remainder of the surgical procedure. The scout nurse was responsible for conducting a time out procedure in which patient and surgical details are communicated to the team in the form of a checklist immediately before the procedure commencing. The scout nurse left the OR soon after and did not communicate where she was going or when she would be back. Her responsibilities consequently fell to another nurse who was floating between two ORs. Several calls were placed on the PA system for the scout nurse to return urgently to the OR, which were unsuccessful. At the end of the procedure the surgeon asked the floating nurse to bring him the patient file so he could update details of the surgery. Details for a different patient

were provided to the surgeon as the floating nurse was unaware of which patient was on the operating table as she had not conducted the time out, which was picked up as an error by the surgeon.

2. We observed a kidney transplant in which the donor and recipient were in adjoining ORs. When the recipient was ready to have the organ transplanted, the surgeons left the OR to see how long it would be before the donor kidney was ready. During this period of time all of the nursing staff (with the exception of the surgical nurse) left the OR without communicating to each other that they were leaving or providing the team leader with enough detail as to where they were going, highlighting both audience and content failures. A scout or anaesthetic nurse was not present in the OR for approximately 10 minutes in which the OR phone rang several times leaving the anaesthetist to leave her patient to answer the phone. While she was on the phone, the anaesthetic machine sounded several times indicating that the patient's heart rate and blood pressure had dropped and needed to be checked. This created a great deal of anger for the surgical nurse (who was also the team leader), leading her to yell "Where are the bloody girls?"

3. During a general surgical procedure a consulting surgeon entered the OR without a mask on and proceeded to enter the sterile zone. The surgical nurse (who was also the team leader) told the consulting surgeon to step back from the sterile zone and questioned "do I need to remind you to wear a mask?" The team leader's requests were ignored by the surgeon and the surgeon stood back when requested to by the surgeon performing the procedure. This example could be considered as a purpose error in which a posed question remains unresolved or unanswered, but is also highlights issues concerning professional roles within the OR.

4. A surgeon entered the OR while the nursing and anaesthetic staff were in the final stages of preparing a patient for surgery. He assisted for a few minutes before stating that he was leaving the OR to scrub and would be back shortly (scrubbing usually takes a couple of minutes and is done immediately before the start of the surgical procedure). The staff finished preparing the patient and waited for the surgeon to return. After a period of approximately twenty minutes a nurse went looking for the surgeon and he was paged on the PA system. He finally returned to commence the surgery after a second page was put out. These actions were indicative of both occasion and content errors.

5. An example of an occasion based communication error was observed in a general surgery procedure when one of the nursing staff spent the majority of the procedure on the internet showing another nurse non-work related websites. The nurse then proceeded to make several phone calls that appeared to be of a personal nature on the OR phone. Throughout her phone conversations the surgeon made repeated requests of the team leader to contact a vascular surgeon who was required in the OR before the surgeon could continue with the procedure. The team leader asked the nurse a number of times to get off the phone so that she could page the vascular surgeon. While waiting for her to finish her call, the surgical team were unable to continue with the procedure.

Although limited examples have been provided above, these examples are reflective of the nature of communication error we have observed within the OR so far. In following the work of Lingard et al. (2004a) these examples are primarily reflective of problems with time and timing (occasion failures); communication exchanges that contain incomplete information (content failures); communication exchanges that exclude a key person (audience failures); with a further example highlighting possible purpose error. These communication failures did not lead to problems with patient care. However, situations such as a surgeon being passed incorrect patient notes, or an anaesthetist having to leave her patient to fulfil absent team members' roles could clearly create an environment in which patient care is compromised. Furthermore, all of the above examples were observed as either causing delays in the surgical procedure and/or tension amongst the OR team which are documented as consequences of communication failure by Lingard et al. (2004a). We discuss possible reasons for such communication errors throughout the remainder of the paper.

DISCUSSION AND CONCLUSION

So far we have observed what we consider to be various issues surrounding team composition that play a role in communication error within the OR. For example, the broader OR teams that we have observed tend to consist of three divergent sub-teams organised along the lines of professions. These consist of: 1) the anaesthetic team (anaesthetist and anaesthetic nurse); 2) the surgical team (the surgeon or

consulting surgeon, surgical registrar and surgical nurse); and 3) the nursing team (scout nurse and team leader). Although nurses cross the various professional groups, each group has a distinct but complementary role within the OR. For example, the anaesthetic team are responsible for patient care and monitoring; the surgical team for performing the surgical procedure; and the nursing team for managing the OR and providing assistance and resources when needed. Each of the team members' roles is important for the successful functioning of the OR and completion of surgical procedures. However, we believe that the OR is an environment in which team roles are complex making it difficult to achieve the notion of balanced teams.

As Sutcliffe et al. (2004: 188) found in their study of communication failures in hospital settings, residents 'described themselves as embedded in a complex network of relationships'. Although they play a pivotal role in teams responsible for patient care, there are hierarchical and professional value differences that impact on the ability of residents to communicate concerns to other team members effectively. Although we have not directly observed any instances where team members in the OR have been apprehensive about communicating their concerns to others, we have observed situations where we suspect there could be power differentials at play within the OR. As indicated in one of the examples above, a team leader was ignored by a consulting surgeon when requested to step back from the sterile zone and put on a surgical mask. However, when the consulting surgeon was instructed to step back by the surgeon in the OR he did so, suggesting that the surgeon's instructions were taken more seriously than those provided by the nurse. Since surgeons have clinical autonomy (Elston, 1991) they do not have to answer to anyone, apart from perhaps other surgeons. Although there is some room to negotiate their role (Allen, 1997), nurses generally do not have the same autonomy and this limits what they are permitted to get away with in the OR context. For instance, nurses are expected to always inform the team leader if they wish to leave the OR for whatever reason. These findings resonate with the work of Manning, Pogson and Morrison (2008: 91) who suggest that 'expectations associated with a particular position in a team...[and] the autonomy in that position' potentially impact on an individual's level of power and influence within the broader team setting, thus affecting the overall balance within the team. Furthermore,

power differentials give rise to a clear separation in roles and role expectations amongst the professional groups represented in the OR.

We believe that clear differences in the roles of professional sub-teams within the OR create three divergent ‘zones of communication’. We refer to these as zones of communication as throughout surgical procedures the majority of communication between staff appears to be limited to these zones. These distinct zones are more or less formed across professional groups within the OR with some variation. We believe that the clear separation of roles in the OR may have some impact on how communication takes place within and across these zones, further complicating communication effectiveness across the OR team. For example, a surgeon may communicate with a registrar or fellow surgeon as to his/her whereabouts but not feel the need to communicate this information to a member of a different professional sub-team, thus leaving the remainder of the OR team unsure of why the surgeon is delayed in returning to the OR after scrubbing. Similarly, nursing staff may briefly verbally or nonverbally communicate to other nurses when leaving the OR in a manner that is acceptable within the nursing team, but leave members of the surgical team out of such communication exchanges (which may include the team leader in some instances). Consequently, zones of communication formed through professional sub-teams and roles may lead to further fragmentation of communication interactions, thus creating an environment in which communication error may be more likely to occur.

Our aim in this paper was to expand on the work of Lingard et al (2004) in exploring possible reasons why communication failure occurs within ORs. As communication failure impacts on patient safety - as well as organisational efficiency more broadly - we believe that this is an area that is worthy of further detailed investigation. We have found in the research so far that team communication is based on the intersection of clearly defined, as well as hierarchical, clinical roles with divergent zones of communication, which, due to traditional values of the various professions, may be not easily overcome through usual methods of team development. This creates a complex organisational environment where role expectations among team members may not always neatly align creating “natural” imbalances within OR teams. In those circumstances where role expectations are not appropriately performed, or not

performed at all, communication within the OR is undermined, which may create a ripple effect within the OR and the potential to compromise patient care. It is possible that such issues and findings are not unique to the OR environment and are prominent in all organisations in which different professional groups interact as part of an overall team. It may be that the culture of ORs and perceived differences in hierarchy combined with clearly demarcated roles within the surgical setting makes differences amongst professions appear to be more obvious. It is also possible that in taking a managerial view of what happens within ORs we may overlook clinical factors that determine how different professional groups within the OR should behave and perform. We acknowledge that team communication within ORs is also likely to be influenced by far more complex concerns than team composition including broader resourcing issues within public hospitals. However, we suggest that exploration of teams within OR settings can provide further insight into the OB intricacies that can emerge from the intersection of roles, power differentials and subcultures within complex organisational environments in which human error has the potential to create catastrophic consequences.

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