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Improving perioperative communication: Can labelled theatre caps play a role?

Abstract

Studies have shown that approximately one third of operating room communications fail. This has a negative impact on patient safety, with half of all adverse events being attributed to communication failures. However, human factors have the capacity to protect patients. Aviation’s human factors strategies provide guidance for staff and are beneficial in the operating room. Currently, no intervention is universally applied to improve operating room communication and team performance. Closed loop communication, though poorly utilised, has been demonstrated to counteract communication errors, therefore protecting patient safety. In 2018, calls were made to take advantage of theatre caps to display staff member’s name and/or aid staff identification and communication. Further research into this initiative with larger participant numbers in a variety of specialities, especially emergency situations, and with greater scrutiny of infection prevention and control guidelines should be considered.

Keywords: communication, patient safety, human factors, staff identification, mental recall

Introduction

In 1995, a retrospective study of Australian hospital admissions (n = 14 000) by Wilson et al. revealed that adverse events were associated with 16.6 per cent of hospital admissions, and half (51%) were considered preventable. Communication was identified as one area requiring improvement to prevent these events reoccurring (11.1%, preventability 81%). Today, preventable adverse events continue to occur globally, with communication still negatively impacting patient safety. Gillespie and Davies defined human factors ‘as the interrelationships between people and their environment and each other’ and communication failure has been identified as the most significant human factor influencing adverse events. Within Australia, this continues despite the National Safety and Quality Health Service standard ‘Communication for safety’. The operating room (OR) is a complex and dynamic environment providing many barriers to effective communication; however, high performing perioperative teams communicate effectively and have better patient outcomes.

In 2004, Lingard et al. concluded that approximately a third (30.6%) of OR procedural communication failed, with similar results (32.7%) noted by Garosi et al. in 2020, indicating that communication is still ineffective, despite calls for improvement. Several interventions have been suggested to improve OR communication and staff identification including, among others, eliminating non-procedural conversations, simulation, colour-coded stickers or theatre caps, writing names on a whiteboard and, recently, displaying name and/or role on the theatre cap.
In 2018, English midwifery student, Alison Brindle, devised the #TheatreCapChallenge which Rob Hackett, an Australian anaesthetist, then championed. They both labelled their disposable theatre cap by writing their name and role on it to aid communication and prevent misidentification. This discussion paper will examine the elements required for effective communication, and the role labelled theatre caps may play in staff identification and communication within the perioperative environment. Thematic analysis of reviewed literature will be presented under the following three themes: ‘effective communication’, ‘staff and role identification’ and ‘labelled theatre caps’.

**Discussion**

Health care’s adverse event numbers have remained relatively unchanged while aviation’s error rate has significantly reduced. Aviation’s human factors training, or crew resource management, was developed to combat complications arising from human factors, such as communication between team members. Aviation recognised that human factors rather than equipment or technical skills were responsible for accidents. Similarly, OR adverse events have predominately been attributed to human factors or nontechnical skills – particularly communication but also teamwork, situational awareness and leadership.

Communication failure impedes teamwork and approximately half of all adverse events are attributed to it. Studies indicate that communication failure occurs in almost all operations, with ineffective communication noted in every observed procedure and occurring every seven to eight minutes. Interprofessional communication is more susceptible to failure due to differing education, roles, perspectives and priorities.

Kenway and Schwaltz’s survey (n=67) explained that staff strongly agreed that communication is important (p = 0.52) but acknowledged that its quality is not of a high standard. A qualitative study by Paige et al. indicated that effective communication is a vital component of efficient teamwork and assists situational awareness. Adverse events are predominately attributed to communication failures but these small studies indicate that OR personnel recognise the importance of communication.

Adam-McGavin et al. in a cross-sectional study analysing data from an OR black box, a data capturing device, noted that while poor human factors predominately contribute to adverse events, well executed human factors have the capacity to protect patient safety. Three quarters of the observed strategies that protected patient safety were attributed to human factors, as humans can adapt to change.

Interventions directed at improving human factors will target the source of the greatest threat to patient safety. Jackson suggests that as clinical complexities are increasing, communication skills must improve; and aviation strategies, such as checklists, clear messaging, read back and names are applicable. Etherington et al. propose identifying creative solutions to counteract communication barriers and call for further research to improve communication within the operating room.

**Effective communication**

Communication is the process of transferring information, by verbal or nonverbal methods, between individuals. Information is not only transferred between sender/s and receiver/s, it must also be recognised and interpreted by the receiver/s, who rely upon verbal, paraverbal (for example, tone and pitch) and nonverbal cues. OR staff must focus upon effective verbal cues as the communication process is compromised in the OR environment, which is complex with numerous simultaneous senders and receivers, multitasking, masks and reduced nonverbal cues. For the process to be successful, there needs to be more than an impression that communication has occurred and information must be interpreted exactly as intended by the sender. Therefore, verbal communication must be audible, concise and use universally recognised vocabulary rather than jargon. Structured formats and checklists enhance communication but closed loop communication, with read back, provides an opportunity to counteract communication failures.

Closed loop communication originates from military radio communications and comprises three phases. Flemming and Carpini describe these phases as:

1. the sender transmitting information to an intended receiver
2. the receiver acknowledging and reading back their interpretation of the received information
3. the sender confirming that the interpretation is correct, thus closing the loop.

This communication loop eliminates ambiguity, permits questioning and has the potential to protect patient safety; however, it is poorly utilised in health care. Objective analysis of an operative emergency simulation concluded that approximately half of the messages were non-
Closed loop communication relies on targeting the intended receiver/s using an individual’s name; therefore, not knowing the name of other team members contributes to poor communication and potential adverse events. Using names is comparable to aviation’s use of call signs. Hardie et al. indicate that in circumstances where names are unknown, using role titles is superior to making the request generalised with ‘you’ or ‘someone’. Generalised requests result in no-one responding, the ‘bystander effect’, as everyone thinks that someone else will respond. In noisy environments, humans can recognise familiar words such as their name, the ‘cocktail party effect’; therefore, using names draws attention faster than a generalised request.

Name usage promotes positive action, or feedback, and good team performance.

**Staff and role identification**

The Garling Report, a New South Wales public hospitals’ Special Commission of Inquiry 2008 report, made recommendations to assist health care communication. Colour-coding uniforms, according to professional role, with name badges displaying name and role in large print, was one recommendation. Similarly, in 2009 the World Health Organization (WHO) released guidelines regarding safety in surgery. The WHO’s evidence-based surgical safety checklist was introduced, as an intervention to reduce medical errors and improve patient safety, by addressing interprofessional communication weaknesses.

The first requirement of ‘time out’, or ‘surgical pause’, is an introduction of everyone’s name and role. These introductions acknowledge that OR staff allocation is fluid and identifying everyone is vital to effectively manage high risk circumstances.

Both the OR environment and human nature present barriers to these recommendations. Colour-coding uniforms enables ‘object communication’, a form of non-verbal communication; however, within the OR environment, attire overwhelmingly is a universal colour, while name badges are frequently covered by surgical attire and difficult to read from afar. A small survey (n = 15) of OR staff at a single centre noted that introductions are an opportunity to commence communication, reducing obstacles.

However, introductions during time out are frequently poorly executed. Ethnographic observations, in a single centre and surgical speciality, noted that only the initial procedure included staff introductions during time out. This was attributed to the Hawthorne effect – when normal behaviour is not displayed because there is an awareness of being observed – as eye contact was made with researchers.

Time out frequently occurs with some team members absent for a variety of reasons. Surgeons and radiographers are frequently not present due to conflicting obligations and availability, while additional staff arrive during a procedure as a substitute or due to an emergency.

Bahrick, Bahrick and Wittlinger’s salient research, illustrated that humans are able to remember faces but remembering names is problematic. Introductions during time out, therefore, may not be enough. Birnbach et al. objectively concluded that, on the whole, team members could not name their colleagues at the conclusion of procedures that used the WHO’s surgical safety checklist. Of the 150 participants, the anaesthetic resident was the least known (28%); however, Birnbach et al. acknowledge that results may be determined by the size of a facility, thus limiting generalisability.

Attitudes towards knowing names and having names known was different between professional groups. Surgeons believed it was more important that everyone knew them than that they knew other’s names, anaesthetists believed it was more important that they knew others than that others knew them, and nurses rated knowing and being known of roughly equal importance. Similarly, Bodor, Nguyen and Broder’s research (n = 50) found that accuracy rates for identifying team members were highest within disciplines (surgeons 84%, anaesthetists 83%, nurses 100%). However, outside their own professional discipline comparative accuracy rates were lower and the differences between disciplines were statistically significant (p<0.0001). While nurses demonstrated the best accuracy, their average accuracy of identification was only 54 per cent when identifying surgeons and 65 per cent when identifying anaesthetists. Anaesthetic trainees remained the least known with some not known at all, especially by surgeons. However, it was not known if introductions were conducted during time out in Bodor, Nguyen and Broder’s research.
Labelled theatre caps

Through social media platforms, #TheatreCapChallenge has gained momentum; however, research assessing its impact is minimal.\(^{29,36}\) Four quality improvement studies were located.\(^{14,27,29,36}\) All four studies indicated that knowledge and usage of names improved but the study sample sizes were small \(n = 100,^{29} n = 236,^{27} n = 84,^{29} n = 78^{29}\) so caution is required when generalising the results. Douglas et al.\(^{27}\) conducted a before-and-after study \((n = 236, 107 responses)\) and reported a statistically significant decrease \((p < 0.001)\) in staff not knowing names of team members \((\text{before } M = 3, \text{after } M = 2)\). Midwives were the only group to have a statistically significant \((p < 0.001)\) improvement in teamwork \((\text{before } M = 3, \text{after } M = 4)\), suggesting \(8\) that labelled caps were beneficial for transient staff members such as midwives.\(^{27}\) Only one randomised study, underpowered and unblinded, was located, it assessed the effect of labelled caps on communication during elective caesarean sections \((n = 20).^{3}\) Brodzinsky et al.\(^{1}\) found a statistically significant difference regarding staff’s knowledge of names \((p < 0.011, 95\% \text{ CI } [64.4\% – 88.0\% \text{ labelled versus } 41.6\% – 67.9\% \text{ unlabelled}]).\) Four observed miscommunications were corrected when a name was used.\(^{8}\) The impact of using labelled theatre caps during emergencies remains unclear as the number of emergency cases in these studies was limited.\(^{2,27,29}\)

Three quarters of patients indicated that they liked the labelled caps, mirroring support provided by a patient collaborative committee.\(^{8,36}\) In addition, labelling theatre caps is viewed as low cost and study results appear favourable; however, barriers were identified.\(^{14,22,29,32,36}\) Some participants were concerned the caps appear unprofessional, others felt they are irrelevant because they know everyone, while some had difficulty containing their hair within the style of cap used for the trial.\(^{15,22,32}\) The most significant barrier identified is that disposable caps, as suggested originally by Alison Brindle,\(^{7}\) have evolved into cloth hats. There are issues associated with cloth hats due to specific infection control standards for the manufacture and laundering of cloth hats and the types of fabric they are made from.\(^{37}\) Proposed solutions include labelling the disposable theatre cap or covering a cloth cap labelled with a dark font with a disposable theatre cap.\(^{28}\)

Conclusion

The incidence of adverse events in health care has remained relatively unchanged despite almost half of the events being considered preventable. In 1995, communication failures were highlighted as significantly contributing to patient adverse events, with calls for improvement. However, recent studies have indicated that OR communication has not improved. Aviation has successfully demonstrated the effectiveness of human factors training which may pave the way for perioperative safety. Closed loop communication and name usage are examples of two strategies intended to improve communication and reduce adverse events.

Care is required to ensure that staff introductions take place as part of team time out before each case. Labelling theatre caps may provide one solution to improve OR communication and this could be achieved by labelling disposable theatre caps or labelling cloth caps that have been manufactured according to appropriate standards and laundering them after each surgical session.

Further research with larger participant numbers in a variety of specialities and circumstances, especially emergency situations, is required. Solutions that meet infection prevention and control standards must be sought and transient staff, such as radiographers, midwives, student doctors and nurses and company representatives, must be considered if implementing this intervention.

Having team members’ names and/or roles displayed on their theatre caps appears, in principle, beneficial for promoting closed loop communication and a safety culture within the perioperative environment. This must be balanced with adhering to infection prevention and control standards and guidelines.

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