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

Maree Yates
gmyates@bigpond.com

Paula Foran
pmt13@bigpond.com

Authors

Maree Yates
MCN (Perioperative Nursing), RN, MACORN

Dr Paula Foran
PhD, RN, FACORN, FACPAN, MACN

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.[1] 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%).[1] Today, preventable adverse events continue to occur globally, with communication still negatively impacting patient safety.[2–4]

Gillespie and Davies[5 p.39] 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.[4,6] Within Australia, this continues despite the National

Safety and Quality Health Service standard 'Communication for safety'.[7] 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.[6,8]

In 2004, Lingard et al.[9] concluded that approximately a third (30.6%) of OR procedural communication failed, with similar results (32.7%) noted by Garosi et al.[3] 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.[3,4,10–13]

In 2018, English midwifery student, Alison Brindle, devised the #TheatreCapChallenge which Rob Hackett, an Australian anaesthetist, then championed.[14] They both labelled their disposable theatre cap by writing their name and role on it to aid communication and prevent misidentification.[15] 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.[16] Aviation's human factors training, or crew resource management, was developed to combat complications arising from human factors, such as communication between team members.[16,17] Aviation recognised that human factors rather than equipment or technical skills were responsible for accidents.[16] Similarly, OR adverse events have predominately been attributed to human factors or nontechnical skills – particularly communication but also teamwork, situational awareness and leadership.[18,19] Communication failure impedes teamwork and approximately half of all adverse events are attributed to it.[4,6] 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.[3,6] Interprofessional communication is more susceptible to failure due to differing education, roles, perspectives and priorities.[6,20] Kenway and Schwaltz's[16] 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.[21] indicated that staff (n = 15) consider 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.[16,21]

Adam-McGavin et al.[18] 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.[18] Interventions directed at improving human factors will target the source of the greatest threat to patient safety.[18] Jackson[19] 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.[4,6] Etherington et al.[6] 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.[22] 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.[6] OR staff must focus upon effective verbal cues as the communication process is compromised in the OR environment[6,20], 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.[23] Therefore, verbal communication must be audible, concise and use universally recognised vocabulary rather than jargon.[20] Structured formats and checklists enhance communication but closed loop communication, with read back, provides an opportunity to counteract communication failures.[23,24]

Closed loop communication originates from military radio communications and comprises three phases.[23] Flemming and Carpini[23] 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.[23] Objective analysis of an operative emergency simulation concluded that approximately half of the messages were non-

directed.[25] Etherington et al.[6] indicate that this may be attributed to limited research assessing closed loop communication within ORs; however, trauma research highlights closed loop communication's effectiveness.[23] In a retrospective observation study of paediatric trauma, El-Shafy et al.[25] illustrated that closed loop communication significantly reduced time to complete tasks. Tasks were completed 3.6 times faster (95% CI (confidence interval) [2.5–5.3], p<0.0001).

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.[4,13] Using names is comparable to aviation's use of callsigns.[4] Hardie et al.[4] 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.[3] 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.[26] Name usage promotes positive action, or feedback, and good team performance.[3,27]

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.[28] Colour-coding uniforms, according to professional role, with name badges displaying name and role in large print, was one recommendation.[28] Similarly, in 2009 the World Health

Organization (WHO) released guidelines regarding safety in surgery.[29] 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.[30] The first requirement of 'time out', or 'surgical pause', is an introduction of everyone's name and role.[30] These introductions acknowledge that OR staff allocation is fluid and identifying everyone is vital to effectively manage high risk circumstances.[30]

Both the OR environment and human nature present barriers to these recommendations.[6] 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.[10,29] A small survey (n = 15) of OR staff at a single centre noted that introductions are an opportunity to commence communication, reducing obstacles.[21] However, introductions during time out are frequently poorly executed.[14] Ethnographic observations, in a single centre and surgical speciality, noted that only the initial procedure included staff introductions during time out.[31] 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.[31] Time out frequently occurs with some team members absent for a variety of reasons.[11,31] 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.[11,31,32]

Bahrick, Bahrick and Wittlinger's[33] 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.[34] 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.[34] 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.[34] Similarly, Bodor, Nguyen and Broder's[35] 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).[35] 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.[35] Anaesthetic trainees remained the least known with some not known at all, especially by surgeons.[35] 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,[14] n = 236,[27] n = 84,[29] n = 78[36]) 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 (before M (mean) = 3, after M = 2). Midwives were the only group to have a statistically significant (p<0.001) improvement in teamwork (before M = 3, after M = 4), suggesting 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).[8] Brodzinsky et al.[8] found a statistically significant difference regarding staff's knowledge of names (p<0.011, 95% CI [64.4% – 88.0% labelled versus 41.6% – 67.9% 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.[8,27,29]

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.[14,27,29,32,36] 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.[14,27,32] The most significant barrier identified is that disposable caps, as suggested originally by Alison Brindle,[13] 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.[38]

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.

Acknowledgment

References

1. Wilson RM, Runciman WB, Gibberd RW, Harrison BT, Newby L, Hamilton JD. The quality in australian health care study. Med J Aust. 1995;163(9):458–71.

2. Australian Commission on Safety and Quality in Health Care (ACSQHC). The state of patient safety and quality in Australian hospitals [Internet]. Sydney: ACSQHC; 2019 [cited 2020 Mar 6]. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/state-patient-safety-and-quality-australian-hospitals-2019

3. Garosi E, Kalantari R, Farahani AZ, Zuaktafi M, Roknabadi EH, Bakhshi E. Concerns about verbal communication in the operating room: A field study. Hum Factors. 2020;62(6):940–53.

4. Hardie JA, Oeppen RS, Shaw G, Holden C, Tayler N, Brennan PA. You have control: Aviation communication application for safety-critical times in surgery. Br J Oral Maxillofac Surg. 2020;58(9):1073–7.

5. Gillespie B, Davies M. Human factors and the perioperative team. In: Sutherland-Fraser S, Davies M, Gillespie BM, Lockwood B, editors. Perioperative nursing: An introduction. 3rd ed. Sydney: Elsevier; 2021, pp.37–54.

6. Etherington N, Wu M, Cheng-Boivin O, Larrigan S, Boet S. Interprofessional communication in the operating room: A narrative review to advance research and practice. Can J Anaesth. 2019;66(10):1251–60.

7. Australian Commission on Safety and Quality in Health Care (ACSQHC). National safety and quality health service standards. 2nd ed. Sydney: ACSQHC; 2017.

8. Brodzinsky L, Crowe S, Lee HC, Goldhaber-Fiebert SN, Sie L, Padua KL et al. What's in a name? Enhancing communication in the operating room with the use of names and roles on surgical caps. Jt Comm J Qua Patient Saf. 2021;47(4):258–64.

9. Lingard L, Espin S, Whyte S, Regehr G, Baker GR, Reznick R et al. Communication failures in the operating room: An observational classification of recurrent types and effects. Qual Saf Health Care. 2004;13(5):330-4.

10. Bentley D. Who's under the mask?: Colour-differentiated identification labels for perioperative staff [Internet]. JPN. 2020 Jun 1 [cited 2020 Sep 4];33(2):e29–e31. DOI: 10.26550/2209-1092.1088

11. Naylor S, Foulkes D. Diagnostic radiographers working in the operating theatre: An action research project. Radiography 2018;24(1):9–14.

12. Nazim SM, Riaz Q. Simulation based team training in surgery – a review. J Pak Med Assoc. 2021;71(Suppl 1)(1):S77–S82.

13. Rosen DA, Criser AL, Petrone AB, Jackson E, Bowers J. Utilization of a role-based head covering system to decrease misidentification in the operating room. J Patient Saf. 2019;15(4):e90–e3.

14. Gorman S, Cox T, Hart RS, Marais L, Wallis S, Ryan J et al. Who's who? Championing the '#TheatreCapChallenge'. J Periop Pract. 2019;29(6):166–71.

15. Kunzmann K. Can the theatre cap challenge solve patient safety? [Internet] Cranbury: MJH life sciences; 2018 [cited 2021 Aug 30]. Available from: www.hcplive.com/view/can-the-theatre-cap-challenge-solve-patient-safety

16. Kenawy D, Schwartz D. An evaluation of perioperative communication in the operating room. J Periop Pract. 2018;28(10):267–72.

17. Hay G. The 'human factor'…Worth considering? JPN. 2020;33(1):19–20.

18. Adams-McGavin RC, Jung JJ, van Dalen A, Grantcharov TP, Schijven MP. System factors affecting patient safety in the OR: An analysis of safety threats and resiliency. Ann Surg. 2021;274(1):114–9.

19. Jackson KS. The importance of non-technical skills and risk reduction in the operating theatre. TOG. 2016;18(4):309–14.

20. Osborne-Smith L, Kyle Hodgen R. Communication in the operating room setting. Annu Rev Nurs Res. 2017;35(1):55–69.

21. Paige JT, Garbee DD, Bonanno LS, Kerdolff KE. Qualitative analysis of effective teamwork in the operating room (OR). J Surg Educ. 2020;78(3):967–79.

22. Macquarie Dictionary Online [Internet]. East Melbourne: Macquarie Dictionary Publishers; 2021 [updated 2021; cited 2021 Sep 16]. Available from: www.macquariedictionary.com.au

23. Flemming AFS, Carpini JA. Eight techniques to support high-quality perioperative communication: Reflections on the NASSF WA survey. Day Surgery Australia. 2019;18(2):9–15.

24. Australian Commission on Safety and Quality in Health Care (ACSQHC). Communication for safety: Improving clinical communication, collaboration and teamwork in Australian health services [Internet]. Sydney: ACSQHC; 2020 [cited 2021 Sep 15]. Available from: www.safetyandquality.gov.au/sites/default/files/2020-12/final_scoping_paper_-_improving_communication_collaboration_and_teamwork_in_australian_health_services_-_june_2020.pdf

25. El-Shafy IA, Delgado J, Akerman M, Bullaro F, Christopherson NAM, Prince JM. Closed-loop communication improves task completion in pediatric trauma resuscitation. J Surg Educ. 2018;75(1):58–64.

26. Jung YS, Paik H, Min SH, Choo H, Seo M, Bahk JH et al. Calling the patient's own name facilitates recovery from general anaesthesia: A randomised double-blind trial. Anaesthesia. 2017;72(2):197–203.

27. Douglas N, Demeduik S, Conlan K, Salmon P, Chee B, Sullivan T et al. Surgical caps displaying team members' names and roles improve effective communication in the operating room: A pilot study. Patient Saf Surg. 2021;15(1):1–6.

28. Garling P. Final report of the special commission of inquiry: Acute care services in NSW public hospitals [Internet]. Sydney: Special Commission of Inquiry; 2008 [cited 2021 Sept 19]. Available from: www.cec.health.nsw.gov.au/__data/assets/pdf_file/0011/258698/Garling-Inquiry.pdf

29. Dougherty J, Slowey C, Hermon A, Wolpaw J. Simple budget-neutral tool to improve intraoperative communication. Postgrad Med J. 2020;96(1141):703–5.

30. World Health Organization (WHO). WHO Guidelines for safe surgery. Geneva: WHO; 2009 [cited 2021 Sep 19]. Available from: https://apps.who.int/iris/bitstream/handle/10665/44185/9789241598552_eng.pdf

31. Ziman R, Espin S, Grant RE, Kitto S. Looking beyond the checklist: An ethnography of interprofessional operating room safety cultures. J Interprof Care. 2018;32(5):575–83.

32. Duncan KC, Haut ER. Competing patient safety concerns about surgical scrub caps – infection control vs. breakdowns in communication. J Patient Saf Risk Manag. 2019;24(6):224–6.

33. Bahrick H, Bahrick P, Wittlinger R. Fifty years of memory for names and faces: A cross-sectional approach. J Exp Psychol Gen. 1975;104(1):54–75.

34. Birnbach DJ, Rosen LF, Fitzpatrick M, Paige JT, Arheart KL. Introductions during time-outs: Do surgical team members know one another's names. Jt Comm J Qua Patient Saf. 2017;43(6):284–8.

35. Bodor R, Nguyen BJ, Broder K. We are going to name names and call you out! Improving the team in the academic operating room environment. Ann Plast Surg. 2017;78(5 Suppl 4):S222–S4.

36. Burton ZA, Guerreiro F, Turner M, Hackett R. Mad as a hatter? Evaluating doctors' recall of names in theatres and attitudes towards adopting #theatrecapchallenge. Br J Anaesth. 2018;121(4):984–6.

37. Australian College of Perioperative Nurses (ACORN). Perioperative attire. In: Standards for perioperative nursing in Australia – Clinical standards. Adelaide: ACORN; 2020. p. 223 – 34.

38. PatientSafe Network. #TheatreCapChallenge: Where's the evidence? [Internet] PatientSafe Network; 2021 [cited 2021 Aug 27]. Available from: https://www.psnetwork.org/theatrecapchallenge-wheres-the-evidence