Evaluation of a Preoperative Checklist and Team Briefing Among Surgeons, Nurses, and Anesthesiologists to Reduce Failures in Communication

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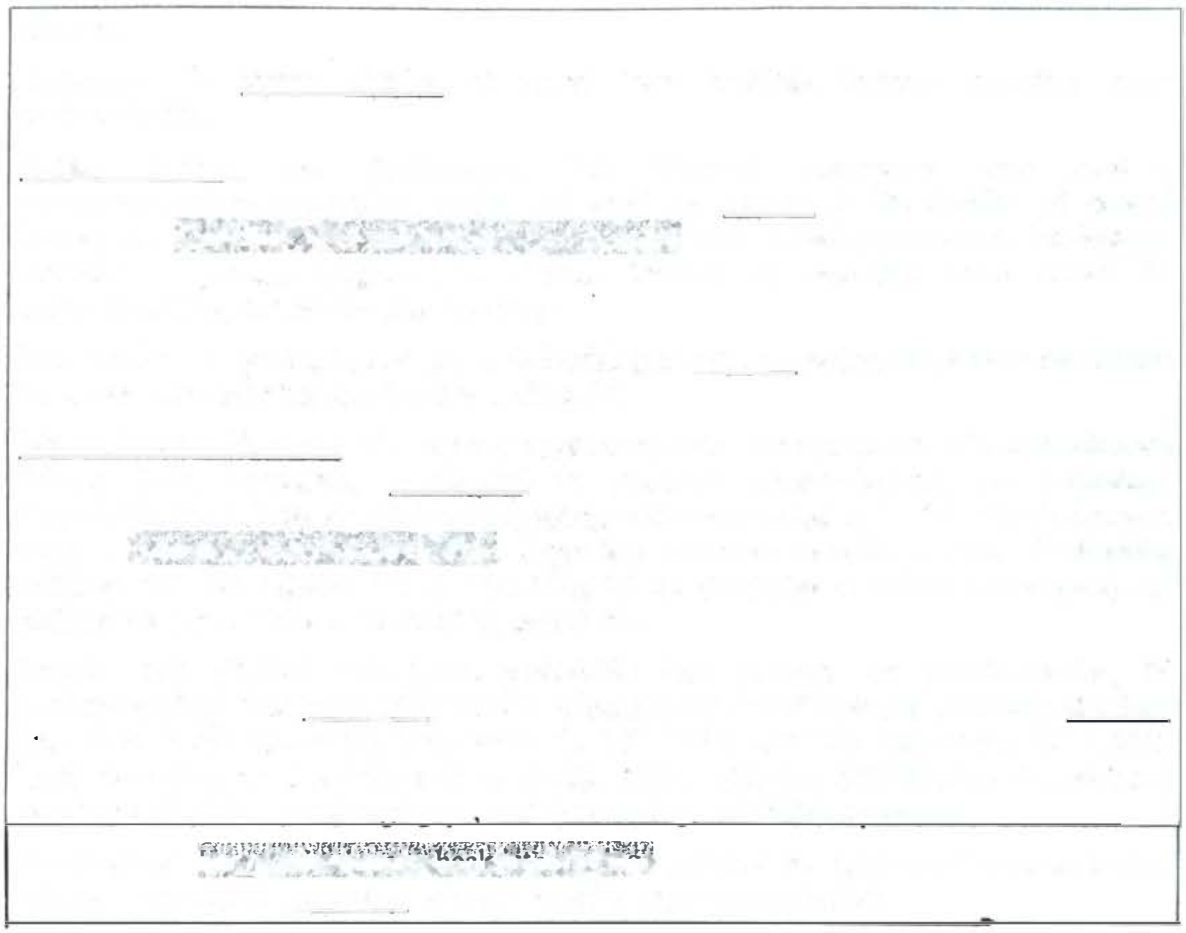

Poor communication is the single most frequent cause of adverse events across all facets of health care, resulting in problems that range from delays in treatment to medication errors to wrong-site surgery.[1-4] Although the imperative to avoid such errors is widely acknowledged,[5] progress has been slow.[6-8] Therefore, various initiatives to improve the quality of care across medical specialties have sought to improve communication within clinical teams.[9-13] Many studies of such initiatives have documented a perception of improvement by members of the care team regarding collaboration,[9] understanding of clinical goals,[10] teamwork,[11] and communication.[13] However, these studies have not objectively assessed whether and how communication actually improved. Such objective assessment of communication is needed to gain insight into the mechanisms of improvement and to determine the most efficient and effective approach to a target problem.[14]

The objectives of this study were (1) to implement a preoperative checklist designed to support a team briefing in the operating room (OR), (2) to objectively assess whether the checklist briefings reduced communication failures, and (3) to characterize the precise nature of improvement in communication associated with this intervention.

Methods

Setting and participants

The study was approved by the research ethics board of the University Health Network, Toronto, Ontario, Canada. The study institution was a Canadian academic tertiary care hospital. Consent was obtained from all participating members of the care team: 11 general surgeons, 24 surgical trainees, 41 OR nurses, 28 anesthesiologists, and 24 anesthesia trainees. All general surgery patients whose elective surgery was scheduled during the study period were eligible for inclusion in the study and were approached for participation via information sheet and/or in-person meeting. Patients were given an information sheet about the study in the preadmission clinic at least 2 days before their surgical procedures. Whenever possible, a research assistant (S.W., S.E.) also met with the patient during the preadmission appointment to request written informed consent to participate. Of the 229 patients approached, 223 consented to participate.

Design

For this 13-month prospective study, we used a preintervention/postintervention design. During the first 5 months, preintervention data were collected. The intervention was implemented over a 3-month period, which was followed by 5 months of postintervention data collection.

Intervention

A year-long process of stakeholder meetings and rapport building preceded the implementation of the intervention. This process included the principal investigator and other research team members negotiating with OR leaders and managers regarding best strategies for integrating a new communication routine in the hospital's OR culture; engaging OR team members in checklist prototype development, refinement, and piloting; and conducting formal presentations at all levels to introduce the evidence relating team communication to safety outcomes. Each of these steps encouraged leaders and team members to think about their team communication practices and to participate in discussions of how these practices could be improved to promote safer teamwork. Training on the conduct of team briefings involved the use of a video dramatization of best briefing practice that was shown to team members individually and in groups prior to the intervention. As well, researchers were present at team briefings to provide feedback and engage in spontaneous discussions about the process with team members in the 3-month intervention phase of the study, prior to the commencement of postintervention data collection. Champions were central to our implementation strategy. Surgeons agreed to take responsibility for initiating checklist briefings, and we both encouraged surgeons to maintain this leadership role and welcomed leadership in other team members.

As previously reported, the checklist briefing was piloted to confirm its feasibility.[12] During each briefing, surgeons, nurses, and anesthesiologists gathered for a review of the upcoming procedure. The briefing was intended to allow team members to share their knowledge of the case and to resolve knowledge gaps and discrepant assumptions of how the case would proceed. The briefing was structured by a 1-page checklist of prompts.[12] The checklist was

designed to be comprehensive yet practical, pertinent for a range of general surgery procedures, and representative of all 3 professions. It contained prompts for patient information (eg, relevant medical history, allergies) and procedural issues (eg, operative plan, antibiotic requirements). A research assistant in the OR (S.W., S.E.) helped gather the team and initiate the briefing. Teams were encouraged to complete the checklist briefing as early as possible before each surgical case. Postprocedure briefing was not part of the intervention. (...)

Results

During the intervention and postintervention phases of the study, 302 checklist briefings were completed. Of the 302 briefings, 295 were observed by the research assistant and 7 were conducted when the researcher was not present. The briefings involved at least 3 participants (1 representative each from surgery, nursing, and anesthesia) and were typically led by a surgeon. Both staff and trainees participated in the briefings. Most briefings (92%) lasted 1 to 4 minutes. A few occurred before patient arrival to the OR (23; 8%); most took place either after patient arrival but before induction of general anesthesia (100; 34%) or after induction of general anesthesia (139; 47%). The timing of 33 briefings (11%) was indeterminable due to incomplete documentation.

Communication failures

One hundred seventy-two procedures were observed (86 preintervention and 86 postintervention), and the number of communication failures was recorded for each (Figure). Table 1 contains representative examples of a variety of communication failures with and without visible consequences. The mean (SD) number of communication failures per procedure declined from 3.95 (3.20) before the intervention to 1.31 (1.53) after the intervention ($U = 1450.5$, $P < .001$). The number of failures that were of no visible consequence was 133 before and 38 after, a 71% reduction (Table 2). More importantly, the number of communication failures that was associated with at least 1 visible negative consequence declined by 64%, from 207 before the intervention to 75 after the intervention (Table 2). The reductions in consequential and inconsequential failures were similar ($\chi^2_1 = 1.09$; $P = .297$).

Briefing utility

Analysis of the field notes revealed instances of "functional utility" in more than a third of briefings (100/295; 34%). Functional utility was identified as communication that identified a problem, ambiguity, or critical knowledge gap; provoked a change in plan; or prompted a follow-up action. Almost half of these communication events (44/100; 44%) had a direct impact on patient care by changing the decisions or actions team members took in the course of the surgical procedure. For example, in 1 briefing, the anesthesiologist noted that cefazolin had been ordered for a patient who had previously experienced a relatively severe reaction to penicillin. Consequently, the surgeon and anesthesiologist decided to administer an alternative antibiotic.

Participant perceptions

The exit survey was distributed to the 83 participants who had taken part in at least 2 team checklist briefings, of whom 77 (93%) responded. Table 3 lists responses, by profession, to a number of survey items. Seventy-one of the respondents (92%) agreed that the briefing allowed the team to identify and resolve problems, and 68 (88%) agreed that it helped guard against mistakes. Sixty-two (81%) of the respondents agreed that the briefings were

worthwhile overall. There was no significant difference in responses among surgeons, nurses, and anesthesiologists.

Comment

Consistent with other studies in the OR, intensive care unit, and emergency department settings, we found that a routine team checklist briefing was feasible and had positive perceived effects on team communication and teamwork.[9-11,13] What distinguishes our study is the objective assessment of the briefing's effect on team communication. The intervention reduced observed communication failures among OR team members 3-fold, from a mean of 3.95 to a mean of 1.31 failures per surgical procedure. Furthermore, the reduction in observed communication failures was not limited to "inconsequential" failures but included an equal reduction in communication failures that were accompanied by a visible negative consequence. **Thus, our objective measurement of an improvement in communication moves beyond self-reporting surveys and represents an advance in the field of patient safety.**

An analysis of briefing content revealed that a substantial number of the briefings benefitted clinical work by revealing knowledge gaps or provoking a change in the care plan. Such instances of utility demonstrate a preventive function for the checklist briefing. Events such as the identification of medication allergies and changes of medication plan are known in safety terms as *near misses*. **Furthermore, our documentation of the consequences associated with communication failures identified several of the intermediate processes along the causal pathway between communication and error.** For example, a tardy equipment request can lead to intraoperative delay and extended anesthesia time. Such intermediate processes exemplify how apparently trivial problems can cascade toward negative consequences, exposing one path by which poor communication decreases resilience in a team's ability to capture errors.[19,20]

(...) Our study has several limitations. Although the briefing reduced communication failures and yielded observable improvements in team communication, this study did not isolate its active component. Improvements could have been driven by the checklist prompts, the physical gathering of team members, or both. A comparative study isolating these variables is required to probe this question. Future research is also required to establish the generalizability of our findings beyond the academic hospital setting, where trainee rotation schedules may influence team coherence and a strong research culture may support uptake of new team practices. Further, we cannot know how our study institution compares with others with regard to the extent of the communication failure problem and, therefore, the potential impact of the intervention. Finally (...), further research is required to determine the clinical significance of these consequences.

Conclusions

Interprofessional checklist briefings reduced the number of communication failures in the OR and promoted team communication that was proactive and collaborative and that prevented errors. The objective measurement of communication outcomes and careful analysis of communicative content in this study advance our understanding of the causal association between communication and safety.

A PREOPERATIVE CHECKLIST : WORKSHEET

WARMING UP : Do you think there is good communication between doctors, nurses, nurses' aides etc at the hospital in general and in the Operating Room in particular? Can you explain?

SOME VOCABULARY IN THE ARTICLE :

a failure :
to assess :
whether :
(study) design :
(study) setting :
a trainee :
to gather :
main outcome measure :
unresolved :
mean :
SD (standard deviation) :
to decline from...to... :
proactive : dynamique

an adverse event :
a delay :
wrong-site :
to avoid :
to acknowledge :
sought :
to gain insight into sth : mieux comprendre qqch
efficient :
effective :
target :
to implement :
elective : non-urgent
to schedule :
a preadmission clinic :
an appointment :
a stakeholder : un intervenant
rapport building : l'établissement/le tissage de rapports
prior to :
feedback :

feasibility :
upcoming :
to intend :
to allow :
to share :
discrepant :
an assumption :
a prompt :
e.g. :
relevant :
an issue :
a requirement :
to conduct :
led :
to last :
to occur :
to record :
field notes : notes d'observation
to guard against : se prémunir
a mistake : une erreur
a respondent : une personne interrogée
worthwhile : utile (qui vaut la peine)
overall :
3-fold :
a near miss : un incident évité de justesse
a pathway : une voie
tardy :
to yield : offrir, donner lieu à
a component :
driven :
to probe (a question) : poser
uptake : adoption, adhésion...
with regard to : en ce qui concerne
to prevent :