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Handover using ISBAR principles in two perioperative sites – a quality improvement project

Abstract

Background

ISBAR is a structured approach to communication between health care providers, particularly for the purpose of transferring patient clinical care. The ISBAR acronym refers to Identification, Situation, Background, Assessment and Request or Recommendation[1].

This paper provides the final report on a quality improvement project (QIP) that was carried out in the perioperative unit at two campuses of a large Melbourne metropolitan hospital. The final phase of this project addressed the concluding audits measuring compliance with ISBAR handover principles at selected handover episodes during the patient care journey through the perioperative suite. The previous two phases established baseline data for all handovers points that are examined in this project plus some initial periodic analysis of the subsequent audits of these perioperative handover points.

Method

This phase of the project was a planned extension of a multisite observational, pre- and post-intervention study. It involved audits of perioperative handovers at selected handover points over six months in 2017. It replicated the design of the previous phases of the project.

Results

The outcome of this phase of the QIP indicated that overall compliance with ISBAR handover principles at observed handover points improved over time. There were exceptions at particular points of the handover journey for specific sections of the audit tool at one site.

Implications for practice

Compliance with ISBAR handover principles has been observed to improve over time in the setting of ongoing audit and augmented education programs. Similar outcomes may be possible in a similar practice setting.

Keywords: handover, ISBAR, anaesthetist, post-anaesthetic care nurse, holding bay nurse, instrument nurse, scout nurse, perioperative

Background

This paper will provide the concluding section of a quality improvement project (QIP). Phase one of this project focussed on handovers from anaesthetists to Post Anaesthesia Care Unit (PACU) nurses across two campuses of the study sites in 2015[2] across two time periods.

Phase two of this project focussed on the final audits of anaesthetists to PACU nurses which took place greater than six months from the initial two audits, plus the collection of baseline audit data from all other handover points[3].

Phase three specifically addresses the results of the subsequent two audits of all handover points except from the anaesthetists to PACU nurses as these two craft groups had already been audited three times in the previous phases of this project.

This paper will also compare all audit data for all other handover points over the three audit time periods and provide conclusions and recommendations for any further investigations for other handover points and craft groups.

Aim

The overall aim of this QIP was to assess the impact of an organisation-wide adoption of ISBAR principles on compliance with desirable handover features in a perioperative suite across craft groups at two campuses of a major metropolitan health service.

Producing baseline data enabled establishment of what was already occurring and how ISBAR handover principles could be introduced in these perioperative settings.

This project also looked at long-term compliance with using ISBAR principles during clinical handovers across craft groups at the two campuses of the metropolitan health service.

The aim of the third and final phase of this project was to evaluate the findings from the results of audits across all other handover points excluding anaesthetists to PACU nurses.

Methods

Design

The design replicated that of previous phases of this project. The method was a multisite observational, pre- and post-intervention design involving audits of perioperative handovers at all other handover points except anaesthetist to PACU nurses over a set period in 2017.

A pre-test/post-test cohort design using audit tools (see Appendix 1) to measure compliance before and after quality improvement interventions was used. As per other phases of this project the audit tool was reviewed and adapted based on the dataset required at each point of care.

Patient handovers by anaesthetists to PACU nurses were excluded as these have been examined in detail in previous publications by the authors.

Statistical methods

Exact 95 per cent confidence intervals for the observed percentage of compliance separately for each site–setting–item–audit combination were calculated and these intervals visualised. To reduce the number of comparisons, four logistic regression models with random intercepts per item, were fitted, adjusting for site and treating audit number as a categorical variable. Each setting was modelled separately. This model allows the handover checklist items to vary in difficulty while assuming a common odds ratio for improvement on all items and for both sites. Subsequently, interaction between site and audit number was tested for to relax the latter assumption.

Sample

A convenience sample of ward, holding bay, scout and PACU nurses were observed over a set period in two perioperative units from two participating hospitals within the same health service. Handovers were performed by ward, scout and PACU nurses. These were included in the audit. There was insufficient data in the literature to guide detailed sample size calculations for comparison before and after compliance with the ISBAR handover tool. The aim was for a minimum of 50 audits to be completed at each point of care.

Intervention

Interventions for this phase of the project followed the same principles as for the other phases of the project. The initial interventions included regular in-service education on the progress, presenting existing findings of the project and the planned audits for anaesthetists and perioperative nurses. The development of other resources specific to the next phase of the project such as cue cards (see supplemental material), posters and audit tools were carried out by the project team.

There was further in-service education for staff, particularly targeting the perioperative nurses. These education sessions also outlined the success of the strategies implemented for the anaesthetic/PACU nurses group.

Additional specific cue cards (see supplemental material) were developed for each nurse-led

handover point which were affixed in holding bays, each operating theatre and every PACU recovery bay.

Vignettes of poor and high quality ISBAR handovers at each of the new handover points were developed and made available on the organisation's electronic education site 'WeLearn'.

Tools

The audit tool used in the previous phases of the study was adapted to meet the specific clinical requirements of the new handover points (see Appendix 1). Audit items that were relevant to those handover points were included and those that were not were removed. They were tested for face and content validity via a group of expert peers and minor modifications were made. The audit tool was pilot tested with a small group at each of the handover points.

Data collection

To maintain consistency with the previous baseline audits for all these handover points, the audits at these handover points were conducted by the perioperative clinical nurse educators who were involved in previous data collection. Staff members of the perioperative units were made aware that these audits were going to take place over the period. The auditors were present at the handover point and indicated their purpose to the staff involved in the handover.

Audits

Across the two sites 94 audits were conducted for the ward nurse to the holding bay. For the scout nurse to PACU nurse there were 89. Finally for the PACU nurse to ward nurse handover point a total of 82 audits were completed across the two sites.

Ethics

Quality assurance was reviewed by the study site Low Risk Research and Ethics Panel. Amended approval (Low Risk Human Research QA Reference Number: QA2014.94) was granted on 8 March 2016 for the remaining two phases of the project.

Formal consent was not sought; however, all staff members were made aware that ISBAR handover audits were being undertaken. This notification took the form of announcements at the regular morning meetings, verbally before handover commenced and by the presence of the auditor.

Participants were non-identifiable as no identifying demographics were recorded.

Results

The outcome measures were the differences in compliance between second and third audits of the ward, holding bay, scout and PACU nurses handover for all audit tool items. Figure 1 shows exact 95 per cent confidence intervals. These results indicate that compliance varies between sites, items, settings and audits. Both improvements and deteriorated compliance is observed. Most items appear to improve by audit three for both sites in the anaesthetics setting and for handover from scout to PACU nurse.

However, the results for holding bay are discordant between sites. Hospital 1 holding bay did well with compliance over the three time periods. Whereas Hospital 2 compliance deteriorated over time particularly for items 6, 7, 8, 9, 10 and 11, which are:

- Item 6 – Ask patient 'What procedure will be performed?' (check against theatre list)
- Item 7 – Confirm procedural consent matches theatre booking
- Item 8 – What is the background/reason for surgery?
- Item 9 – Any other medical or surgical concerns/history
- Item 10 – Follow 'Passport to surgery document AD 250'
- Item 11 – Were any potential patient 'at risk' factors discussed/identified?

These included items are a component of a comprehensive 'check in' process for patients presenting to the theatre complex for procedures. This is referred to locally as the 'Passport to surgery document AD 250'. Some of these are mandatory safety checks and the patient cannot proceed to the next stage of the operative journey without completion, e.g. 'Confirm procedural consent matches theatre booking'.

As item-wise compliance varies, it is difficult to interpret overall impact of the intervention. A mixed model was fitted to obtain an estimate of average change in compliance, assuming a common odds ratio (OR) for both sites and all items, but separate models were fit for each setting. These mixed models provide evidence of changes between audits for all four settings, with:

- anaesthetics – consistent improvement (OR for audit 2 versus 1: 1.31 [1.09; 1.58], OR for audit 3 versus 1: 3.34 [2.65; 4.21], $p < 0.0001$)
- holding bay – consistently getting worse (OR for audit 2 versus 1: 0.23 [0.17; 0.32], OR for audit 3 versus 1: 0.20 [0.15; 0.27], $p < 0.0001$)
- PACU to ward – slightly worse in audit 2, best results in audit 3 (OR for audit 2 versus 1: 0.76 [0.52; 1.11], OR for audit 3 versus 1: 1.86 [1.29; 2.69], $p < 0.0001$)

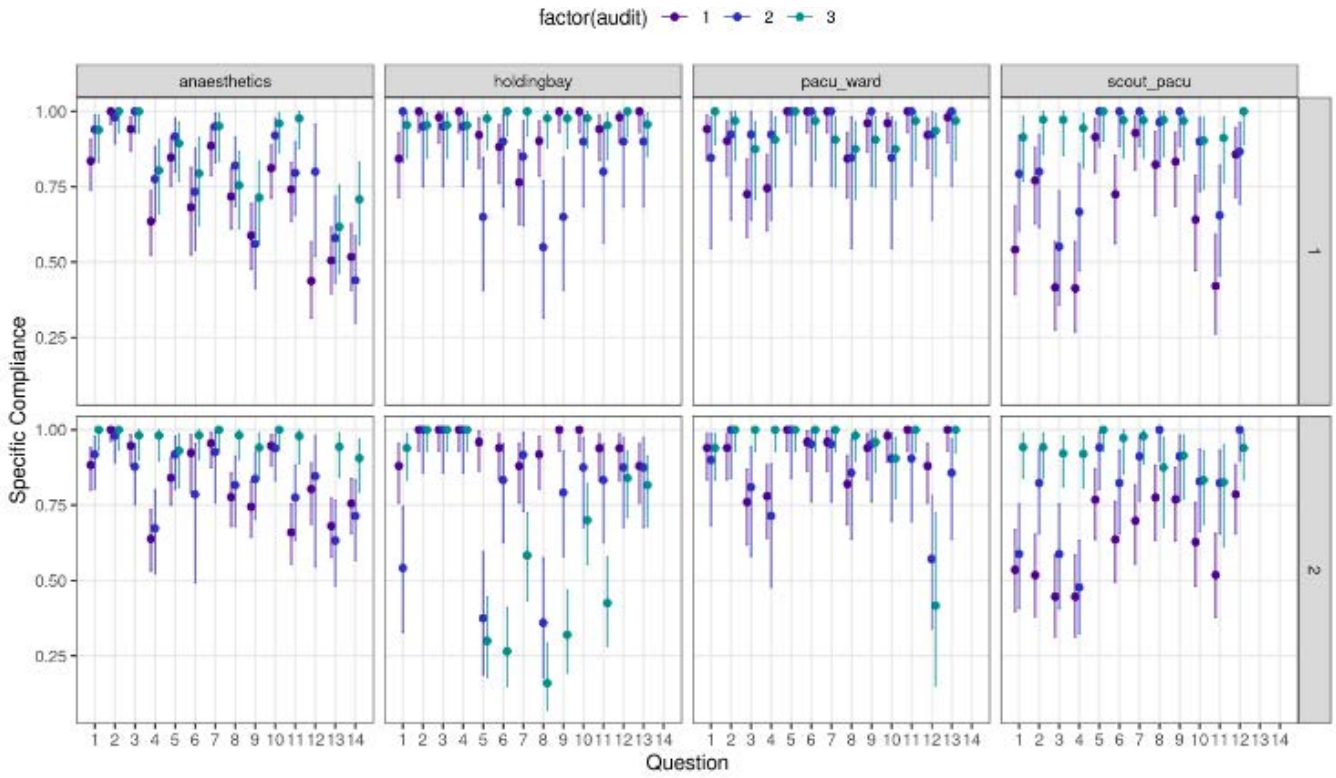

Figure 1

The items in Figure 1 refer to specific items on the related audit tool as found in Appendix 1, i.e. the question number relates to each question for each specific audit tool. For example in the PACU to ward nurses audits, question 1 in Figure 1 refers to question 1 in the audit tool 'Self identification'.

- scout to PACU – consistent improvement (OR for audit 2 versus 1: 2.74 [2.17; 3.45], OR for audit 3 versus 1: 10.35 [7.58; 14.14], p < 0.0001)

As the assumption-free results in Figure 1 indicate difference between sites, an interaction between site and audit number in the mixed models was tested for. These tests provide evidence that effect sizes varied between sites for anaesthetics (p < 0.0001), holding bay (p < 0.0001) and PACU to ward. (p = 0.002) No evidence for variation in effect size was found for scout to PACU (p = 0.76).

Findings in context of the literature

The methodology and findings of this quality improvement project support most of the previously identified themes and published consensus recommendations on perioperative handover[4]. These include:

1. common processes
2. behaviours of successful handovers
3. metrics for effective handovers
4. education and training for handover
5. best practices for handover implementation
6. patient engagement[4].

Standardisation and behaviours of successful handover practices

This quality improvement project supports the literature that a structured handover results in a more thorough transfer of clinical information. This project identified that overall standardisation of handover assisted with compliance with the chosen handover principles. The literature supports this premise that standardisation of handover 'is a strong force towards a shared understanding of a situation and its demands on a team. It provides a common framework for team behaviour in the sense of a "shared mental model"'[5].

This project is similar to the findings of McFarlane et al. who state that unstructured handovers given within the perioperative environment present risk of potentially harmful communication errors and transfer of inaccurate information occurring[6,7]. McFarlane also concurs

that these types of errors may be avoided by using standardised handover protocols such ISBAR handover principles[7]. Møller, Madson, Fuhrmann and Ostergaard agree that handover tools and/or protocols and environmental change were generally associated with significant improvements in the number of information omissions[8]. Therefore, as was identified through this project it is imperative that organisations consider using a structured handover process to reduce the risk of communication safety incidents in the perioperative setting.

This quality improvement project has observed that more thorough handovers are occurring since the introduction of the structured ISBAR principles. Similar observations have been made by others[9,10].

Metrics (audit tools)

This QIP use of audit tools concurs with the literature. Standardised audit tools provide a consistent framework of behaviours, content and processes in line with expectations of quality practices[11].

The development of an original and contextualised audit tool is similar to what has been found in the literature. Pallekonda et al. suggest that a novel process audit be developed to help ensure that a perioperative handoff protocol is used accurately and appropriately over time[12].

Moreover Kurrek agrees with the use of audit tools, as in this QIP, stating 'a good starting point is some form of audit … to assess current practice. The results of the audit could form a basis for initial discussions with staff. This process would identify documenting deficiencies, obtain support and begin the planning process for developing the handoff tool'[13 p.51].

Variability between craft groups

Another finding of this QIP is that the variability between craft groups can lead to inconsistencies in the quality of perioperative handovers. It has been identified in the literature that nurses are often in a natural leadership position to improve safe practices during perioperative handover and can ensure that handovers are carried out using the adopted structured principles[14]. The project contradicts the literature and found that, overall, anaesthetists were the most consistent in compliance with the adopted handover principles across the entire project, more than any other group examined and, indeed, there was inconsistent variability between the other craft groups in this project.

Other literature also supports the finding of the variability between craft groups such as Pimental who observed significant variability in perioperative safety culture, across dimensions of safety climate, professional roles and levels of training[15]. Manias et al. found that complex barriers impeded the conduct of effective handovers, including insufficient opportunities for training, organisational factors, lack of role modelling and lack of confidence and understanding about handover processes[16].

Education strategies

The literature supports the premise that evaluation of education efforts remains recommended as there is a paucity of research describing educational interventions to improve handover and assessing their effectiveness[17]. This project supports this premise and has contributed to the literature in this area. Qualitative and mixed approaches as in this project may be more suitable to identify opportunities for improvement of the education required[18]. Therefore similar education strategies could be utilised in comparable health care environments to provide retention and compliance. A proposal by Cate et al. in their paper is a strong recommendation that policy makers and educators have called for added training of health care professionals to improve their skills and competence for conducting handovers[19].

Strengths and limitations

Strengths of this quality improvement project were that there was a consistent approach in development of data collection tools, education strategies and data collection.

Limitations were that these audits only measured the use of ISBAR handover principles for one period of time for each audit and only at two campuses of a large multi-campus health care organisation. Applicability to other settings of this organisation was not part of this project.

A logistic regression model was used with a random intercept for each question. Indeed, variation in compliance was observed between items. A direct way to assess overall compliance would have been to model the sum of compliance on all items as a score between 0 and 14; however, for many of the audits, compliance data was not recorded for each item. This could be due to not all items in the audit tool applying to every handover because of the nature of the procedure so items were omitted. There was also inconsistency in scoring as some auditors would indicate N/A if not applicable where others would leave the response blank assuming an understanding that the item was not applicable in that situation. This

occurred even though all auditors received the same instructions on how to complete the audits.

Limiting data to complete cases would have severely reduced the sample size and it is possible that audit observations with complete data were obtained during better circumstances, which could bias the analyses. Similarly, assuming that unobserved items were identical to observed ones in the same spot audit is susceptible to bias as differences in difficulty by item were observed, e.g. compliance on the 'easier' ten items does not guarantee compliance on the more difficult items.

Differences in individual performance were observed in compliance with the handover process; however, the lack of unique identifiers for participating clinical staff meant it was not possible to quantify the impact of outlier performances on the overall results. It is feasible that selected staff participating at different audit time points had a disproportionate impact on the overall results. This potentially reduces the generalisability of the findings.

A discrepancy at the ward to holding bay handover was observed. There were significant changes in the personnel who undertook the holding bay nurse role during the audit period where the usual incumbent in that position was on long-term sick leave. The possibility that the lack of trained personnel who undertook this role may have affected the outcome. This finding may provide evidence that inexperience in this role could have possibly attributed to the findings in this audit and may highlight the need for targeted ISBAR handover education for any staff member who undertakes an unfamiliar role.

Additionally, as a result of handovers being observed and audited, it is likely that the Hawthorne effect may have biased outcomes.

This QIP only addressed the craft groups' compliance to the ISBAR standardised handover protocol which does not include patient interaction. No patient involvement was included at any of the handover points.

Discussion

These audits observed a change in compliance with specified components of the ISBAR handover tool following targeted education-based interventions. In two settings out of four, there was observable improvement both initially and at subsequent audit. In one setting there was little evidence of change initially but evidence of improvement at final audit. These results are compatible with uptake and retention. However, results for one setting out of four, 'holding bay', differed between two sites and on average indicated reduced compliance.

This project also identified that there were other handover points in the perioperative patient journey that were not considered 'official' handover points. This project then raises the question whether these unofficial handover points should be addressed in any future studies so that a more complete appraisal of the handover practices within perioperative settings could be examined.

Finally, another suggestion is having the patient's perspective on the perioperative handover process could add value to meeting the aims of handover, such as that in a ward situation (bedside handover), which is to provide a holistic and seamless transfer of patient care information to facilitate safe care outcomes.

Conclusion and recommendations

Overall, this QIP demonstrated that education strategies used across perioperative health care craft groups such as those implemented in this project has led to improved retention and compliance in utilising the augmented and structured ISBAR handover principles. This project together with the literature supports the premise that the use of structured ISBAR handover principles improves the quality of handovers.

Additionally as a result of this QIP, other perioperative handover points, such as anaesthetic nurse to scout nurse, were identified. These further handover points may warrant investigation to provide a holistic perspective of the value of structured handovers in the perioperative setting.

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Appendix 1

Modified handover audit tools for phase two of project for handover points excluding anaesthetists to PACU nurses

HANDOVER AUDIT IN HOLDING BAY NURSE			Yes	No
I	IDENTIFICATION	Staff		
		Patient name (first and last name)		
		Patient date of birth		
		Patient UR number		
S	SITUATION	Why is the patient being transferred to holding bay?		
		Ask patient 'What procedure will be performed?' (check against theatre list)		
		Check consent is correct with theatre list		
B	BACKGROUND	What is the background/reason for surgery		
		Any other medical or surgical concerns/history		
A	ASSESSMENT+ ACTIONS	Follow Passport to surgery AD 250		
		Were any potential patient 'at risk' factors discussed/identified		
R	RESPONSIBILITY+ RFERRAL	All required patient documentation present		
		Patient readiness for surgery		
		Total Score = 13		

HANDOVER AUDIT SCOUT TO PACU NURSE			Yes	No
I	IDENTIFICATION	Self		
		Patient name (first and last name)		
		Patient date of birth		
		Patient UR number		
S	SITUATION	What procedure (s) was performed		
B	BACKGROUND	Any surgical/intra-operative concerns		
A	ASSESSMENT+ ACTIONS	Dressings		
		Drains		
		Local		
		Specimens		
		Is patient identified as 'at risk'?		
R	RESPONSIBILITY+ RFERRAL	All required patient documentation present		
		Total Score= 12		

HANDOVER AUDIT PACU TO WARD/DPU NURSE			Yes	No
I	IDENTIFICATION	Self		
		Patient name (first and last name)		
		Patient date of birth		
		Patient UR number		
S	SITUATION	What procedure (s) was performed		
		What type of anaesthetic the patient had		
		Drugs given intra-operatively		
B	BACKGROUND	What was the background/reason for surgery		
		Any relevant history?		
		Any intraoperative/medical concerns		
A	ASSESSMENT+ ACTIONS	Follows Operation report and Post-operative orders AD 253		
		Is patient identified as 'at risk'?		
R	RESPONSIBILITY+ RFERRAL	Discharge summary completed and documented		
		Total Score= 13		