

Handover between anaesthetists and post-anaesthetic care unit nursing staff using ISBAR principles: A quality improvement study

Authors

Patricia Kitney

RN, BAppSc-Nsg, DAppSc-Nsg Ed, MEd (Research), GradCert LdrshipEdTrng, GradCertPeriop
Western Health, Sunshine, Vic

Raymond Tam

MBBS FANZCA
Western Health, Sunshine, Vic

Paul Bennett

RN BN GradCertSc (App Stats) MHSM PhD
Deakin University, Geelong, Victoria,
Western Health – Nursing Research
Centre, Sunshine, Vic

Dianne Buttigieg

RN, BHSc (Nursing), Grad Cert Periop Nsg,
DipMgt
Western Health, Sunshine, Vic

David Bramley

MBBS MPH FANZCA
Western Health, Sunshine, Vic

Wei Wang

Msc (Stats) GdipSci (Stats) MD PhD
Deakin University, Geelong, Vic

Corresponding author

Patricia Kitney

Clinical Nurse Educator - Perioperative
Services
Western Health, Gordon Street, Footscray
VIC 3011
Tel. 03 8345 0506
patricia.kitney@wh.org.au

Abstract

A structured approach to communication between health care professionals contains introduction/identification; situation; background; assessment and request/recommendation (ISBAR). ISBAR was introduced into the post-anaesthetic care unit (PACU) of a large Victorian health service in 2013. The aim of this study was to measure the effect of an education program on ISBAR compliance.

Method: A pre/post-test design using a 14-item audit tool was used to measure compliance to ISBAR before and after an education intervention in two acute hospitals in Melbourne, Victoria. The intervention consisted of one 30-minute education session to anaesthetists, and two 30-minute education sessions to PACU nurses, combined with visual cues using ISBAR wall posters.

Results: In Hospital A, significant improvement from pre- to post-audit was found in the items of cardiovascular assessment ($\chi^2 (1) = 4.06, p < .05$), respiratory assessment ($\chi^2 (1) = 12.85, p < .01$), analgesia assessment and actions (Fisher's exact test $p < .05$) and responsibility + referral ($\chi^2 (1) = 4.44, p < .05$). For Hospital B significant improvement was found in communication difficulties ($\chi^2 (2) = 13.55, p < .01$) and significant decreased performance was found in respiratory assessment ($\chi^2 (1) = 8.98, p < .01$) and responsibility + referral ($\chi^2 (1) = 13.26, p < .01$).

Implication for practice: The results from this study cohort suggest an augmented education program may produce mixed results for ISBAR compliance. More than education and visual tools may be required to improve PACU ISBAR compliance.

Keywords

Handover, anaesthetist, post-anaesthetic care, post-anaesthetic nurse.

Background

In 2012 the Australian Commission on Safety and Quality in Healthcare (ACSQHC) identified clinical handover as a key standard in the national quality and safety framework¹. With over seven million clinical handovers occurring annually in Australian hospitals, it was concerning that global handover processes have been highly variable and unreliable, and associated with patient risk and patient safety². A recent review of 31 postoperative handover primary research studies confirmed the positive association between handovers and adverse events and recommended the standardisation of handover processes³. Standardisation of clinical handover is likely to improve the safety of patient care as critical information is more likely to be transferred and acted upon¹.

In the perioperative environment surgeons, scrub nurses, anaesthetists, anaesthetic nurses and scout nurses are all involved in the care of the patient during

a surgical procedure. Each team member is accountable for the information they transfer from one part of the patient journey to the next; however, in Australia, it is most commonly the anaesthetist who performs the post-operative handover⁴. The post-operative handover consists of the transfer of information of the patient's state and care by the anaesthetist to the post-anaesthetic care unit (PACU) staff with appropriate briefing on relevant aspects of the surgery and anaesthetic technique⁵.

ISBAR is a structured approach to communication between health care providers. ISBAR refers to: Introduction/Identification; Situation; Background; Assessment; and Request/Recommendation⁶. The introduction of ISBAR to Western Health, a large metropolitan health service in Melbourne, Victoria, was undertaken to provide a standardised organisation-wide approach⁷. The introduction of ISBAR identified issues of non-compliance, resulting in an education strategy being

implemented. The aim of the quality improvement project reported here was to measure the effect the education program had on ISBAR compliance.

Methods

Design

A pre/post-test design using audit tools to measure compliance before and after a quality improvement intervention.

Sample

A convenience sample of anaesthetists were observed over a one-week period in two PACU units from two participating hospitals within the same health service. Handovers were performed by anaesthetists providing a clinical handover of their patients to PACU nursing staff were included in the audit. There were no data in the literature to guide detailed sample size calculations for comparison of before and after compliance with the ISBAR handover tool in PACU. Assuming normally distributed population data in the independent samples, a proposed sample size of 100 observations in each group would give 83% power to detect a difference in proportion of handover compliance from 50% to 70% at a significance level of 0.05 in a post-hoc analysis of entire cohort. An historical case load suggested that this would result in a sample of approximately 200 events (clinical handovers).

Intervention

The intervention consisted of two strategies. Firstly, in-service education session to anaesthetists and PACU nurses on current handover performance was undertaken. The education sessions were mainly of a didactic nature, presenting evidence supporting the introduction

Identification	Patient Staff members
Situation	Procedure Anaesthetic type
Background	Allergies Co-morbidities Communication difficulties (including non-English speaking)
Assessment & Actions	Intra-operative issues: <ul style="list-style-type: none">• surgery and anaesthesia Current issues: <ul style="list-style-type: none">• cardiovascular observations, limits, therapy• respiratory observations, limits, therapy• analgesia interventions to date, orders• additional needs, e.g. anti-emetics, BSL.
Responsibility & Referral	Name and contact details ICU/HDU/ward/discharge home

Figure 1: ISBAR cue card

of structured clinical handover. The model of ISBAR handover was presented and reinforced. Secondly, ISBAR poster-sized cue cards (Figure 1) were fixed to the walls of all PACU patient bays.

Tool

The audit tool was developed measuring the adherence to ISBAR principles during the handover from anaesthetist to PACU nurses (Figure 2). This was designed to encompass guidelines from the Australian and New Zealand College of Anaesthetists (ANZCA) and the health care organisation. To assist with face and content validity the tool was disseminated to expert clinicians where minor modifications

were made. The tool was then piloted before the study where further minor modifications were undertaken.

Data collection

The pre-audit was undertaken immediately following the introduction of ISBAR. The education and poster strategy was implemented in the succeeding two weeks immediately following the audit. The post-audit was undertaken four months after the education and poster strategy. The audit tool (Figure 2) was completed by Sunshine and Footscray PACU nursing staff during the clinical handover by the anaesthetist once the patient had been connected to monitoring equipment and the patient was

deemed stable by the PACU nurse. The audit tool was piloted in 10 handovers by two PACU nurse educators and found to be practical, timely and demonstrated high inter-rater agreement. Audits were undertaken by PACU nurses who had been trained to complete the audits during the two education sessions. Completed audits were placed into a secure box, which were collected from the box at the end of the one-week period by the project team leader (PK).

Ethics

Quality assurance was reviewed by the Western Health Low Risk Research and Ethics Panel. Approval was granted on 13 October 2014. Low-

I	Identification	Patient name	Yes	No	N/A
S	Situation	Procedure			
		Anaesthetic type			
B	Background	Allergies			
		Co-morbidities			
		Communication difficulties (including NESB)			
A	Assessment & Actions	Intra-operative issues: surgery and anaesthesia			
		Current issues:			
		Cardiovascular: observations, acceptable limits, therapy (including IV fluids and interventions)			
		Respiratory: observations, acceptable limits, therapy (includes O ₂)			
		Analgesia: interventions to date, ongoing therapy			
		Additional needs: e.g. Antiemetics, X-ray, biochemistry/haematology/BSL			
		Other comments			
R	Responsibility & Referral	Name and contact details			
		ICU/HDU/ward/discharge home			
TOTAL SCORE			/14		

Instructions to PACU nursing staff:

Maximum possible score = 14

Each 'yes' response scores a 1; Each 'no' response or 'N/A' response scores a 0

Figure 2: ISBAR audit tool

risk human research QA Reference Number: QA2014.94. Participants were non-identifiable as no identifying demographics were recorded.

Outcome measures

The outcome measures were differences in compliance between pre- and post-audit for all 14 audit tool items. These items recorded the identification of patient name, procedure, anaesthetic type, allergies, co-morbidities, communication difficulties, surgery and anaesthesia intraoperative issues, cardiovascular observations, respiratory observations, analgesia, additional needs, referral name and contact details, and likely transfer destination.

Data analysis

Crosstabs was used to examine the categorical nature of the data in determining whether there was a significant difference between the pre-audit (audit 1) and the post-audit (audit 2) across the 13 items of interest. The analysis was performed separately on two separate hospital sites (Hospital A and Hospital B). Pearson's chi-square statistics were reported. In addition, Fisher's exact tests were also reported for the items that the numbers were less than 5 in each cell.

Results

Table 1 shows the percentages and test results of crosstabs of the 283 handovers from the two hospital PACUs (Hospital A, n=148, Hospital B, n=135). In Hospital A, significant differences were found between audit 1 and audit 2 for the items of *Assessment & Actions: Cardiovascular: observations, acceptable limits, therapy (including IV fluids & interventions)* ($\chi^2(1) = 4.06, p < .05$); *Assessment & Actions: Respiratory: observations, acceptable limits, therapy (includes O2)* ($\chi^2(1) =$

12.85, $p < .01$); *Assessment & Actions: Analgesia: interventions to date, ongoing therapy* (Fisher's exact test $p < .05$); and *Responsibility & Referral: ICU/HDU/ward/discharge home* ($\chi^2(1) = 4.44, p < .05$).

For Hospital B, three items showed significant differences including *Background: Communication difficulties (including NESB)* ($\chi^2(2) = 13.55, p < .01$); *Assessment & Actions: Respiratory: observations, acceptable limits, therapy (includes O2)* ($\chi^2(1) = 8.98, p < .01$); and *Responsibility & Referral: ICU/HDU/ward/discharge home* ($\chi^2(1) = 13.26, p < .01$).

Discussion

The major findings from this audit demonstrate that education augmented with ISBAR posters can be associated with both an improvement but also decreased compliance of ISBAR principles. There were no audit elements where both hospitals improved significantly. In the higher acuity hospital (Hospital A) improvements were seen in the reporting of respiratory and cardiovascular observations, analgesia concerns and referral, whereas in Hospital B improvements were only noted in reporting communication difficulties. Improvements in Hospital A may have been associated with the increased acuity of patients occurring at this hospital. Hospital B's broader cultural profile may have had an influence on the attention to communication challenges during these handovers.

Decreased compliance in Hospital B in the areas of respiratory observation and referral could not be explained. The contrast between this declining compliance and the improvement in these areas in Hospital A suggests that there is more influence on ISBAR compliance than simply an educational strategy

augmented by cue cards. The importance of leadership and culture on the quality implementation of structured communication has been identified as vital² and this may have had an influence on our results. In saying this, additional change strategies to supplement an education strategy may improve ISBAR compliance.

The PACU environment can be a stressful area and standardised care can improve patient care⁸. Handover failures are common and can lead to diagnostic and therapeutic delays³. Poor handover can also lead to wasted resources⁶. The breakdown in the transfer of information has been identified as one of the most important contributing factors in serious adverse events and is a major preventable cause of patient harm¹. Given the complexities of communication in health services and the mixed results from this study, more complex communication training⁹ may augment standardised structured handover practices such as ISBAR.

ISBAR is an example of standardising a common process, handover, to facilitate a comprehensive transfer of patient information, assessment, progress and future state. Our study has demonstrated some success in improving this standardisation, with the ultimate goal of standardising and improving patient care processes.

Strengths and limitations

The major strength of this study was that it was undertaken in a practice environment in two large teaching hospitals within the one health service. In saying this, factors influencing ISBAR compliance, such as PACU leadership and management culture, were not objectively measured. ISBAR was the designated hospital organisations' handover

Item	Hospital A				Hospital B			
	Audit 1	Audit 2	Pearson Chi-square p (2-sided)	Fisher's Exact Test p (2-sided)	Audit 1	Audit 2	Pearson Chi-square p (2-sided)	Fisher's Exact Test p (2-sided)
	Yes (%)				Yes (%)			
1. Identification: Patient name	79.8	91.8		.10	79.8	91.8		.10
2. Situation: Procedure	99.0	100		1.00	100	98.0		.37
3. Situation: Anaesthetic type	94.9	87.8		.18	94.1	100		.16
4. Background: Allergies	59.4	67.3	.35		65.5	78	.13	
5. Background: Co-morbidities	80.6	91.8		.09	89.2	90.0		1.00
6. Background: Communication difficulties (including NESB)*	27.6	22.4	.07		30.6	44.0	.00	
7. Assessment & Actions: Intra-operative issues: surgery and anaesthesia*	69.1	50.0	.06		70.4	80.9	.42	
8. Assessment & Actions: Cardiovascular: observations, acceptable limits, therapy (including IV fluids and interventions)	65.7	81.6	.04		83.5	82.0	.82	
9. Assessment & Actions: Respiratory: observations, acceptable limits, therapy (includes O ₂)	53.5	83.7	.00		81.2	57.1	.00	
10. Assessment & Actions: Analgesia: interventions to date, ongoing therapy	80.8	93.9		.05 (.048)	96.5	93.9		.67
11. Assessment & Actions: Additional needs: e.g. Anti-emetic, X-ray, biochemistry/haematology/BSL*	71.1	79.6	.27		67.1	78.0	.18	
12. Responsibility & Referral: Name and contact details	51.1	63.3	.16		71.4	60.4	.19	
13. Responsibility & Referral: ICU/HDU/ward/discharge home	53.2	71.4	.04		76.2	44.9	.00	

*Item response options comprising three categories

Table 1: Comparison between audit 1 and audit 2 for Hospital A (n=148) and Hospital B (n=135)

policy. Alternative common iterations such as ISOBAR and SBAR were not assessed. This was a pre/post-test audit design and thus our findings should not be generalised to other PACU contexts.

Conclusion

This study has shown ISBAR compliance in handover between anaesthetist and PACU nursing staff can be improved through education augmented with posters. However, significant elements of decreased compliance have also been observed. Various contextual factors are likely to affect ISBAR compliance and should be considered when employing strategies to improve handover standardisation.

References

1. National Safety and Quality Health Service Standards: Australian Commission on Safety and Quality in Health Care — Standard 6: Clinical Handover — Safety and Quality Improvement Guide, 2012. Canberra: Australian Government.
2. Botti M, Bucknall T, Cameron P, Johnstone MJ, Redley B, Evans S & Jeffcott S (2009). Examining communication and team performance during clinical handover in a complex environment: the private sector post anaesthetic care unit. *Medical Journal of Australia*, Vol. 190, No. 11, S157–160.
3. Segall N, Bonifacio AS, Schroeder RA, Barbeito A, Rogers D, Thornlow DK, ... & Mark JB (2012). Can we make postoperative patient handovers safer? A systematic review of the literature. *Anesthesia & Analgesia*, Vol. 115, No. 1, pp. 102–115.
4. Anumakonda V, Doijode S & Bhaskaran S (2011). A prospective audit of multidisciplinary handover (MDHO) of responsibility for patients in the post anaesthetic care unit in a District General Hospital (DGH): Patient safety perceptive. *European Journal of Anaesthesiology*, Vol. 28, Suppl. 48, p. 215.
5. Nagdeve N & Kada VK (2011). Quality of handover of patients to the postanesthetic care unit staff: 17AP1–2. *European Journal of Anaesthesiology*, Vol. 28, p. 214.
6. Australian Commission on Safety and Quality in Healthcare: OSSIE Guide to Clinical Handover Improvement 2012. www.safetyandquality.gov.au/wp-content/uploads/2012/01/ossie.pdf Retrieved 10 July 2015.
7. Western Health (2014). Clinical Handover. Policy code P-CC5.2 [inside.wh.org.au/policies-procedures-forms/WHDocuments/Clinical Handover.docx](http://inside.wh.org.au/policies-procedures-forms/WHDocuments/Clinical%20Handover.docx) Retrieved 10 July 2015.
8. Gill SD, Hughes A, McCall-White M, Pascoe H (2014). Clinical Handover: An Audit from Australia. *AMJ*, Vol. 7, No. 9, pp. 363–371.
9. Watson BM, Manias E, Geddes F, Della P & Jones D (2015). An analysis of clinical handover miscommunication using a language and social psychology approach. *Journal of Language and Social Psychology*, Online before print May 14, DOI: 20150261927X15586200.