



City Research Online

City, University of London Institutional Repository

Citation: Spooner, A. J., Aitken, L. M., Corley, A. & Chaboyer, W. (2017). Developing a minimum dataset for nursing team leader handover in the intensive care unit: A focus group study. *Australian Critical Care*, 31(1), pp. 47-52. doi: 10.1016/j.aucc.2017.01.005

This is the accepted version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: <https://openaccess.city.ac.uk/id/eprint/16518/>

Link to published version: <https://doi.org/10.1016/j.aucc.2017.01.005>

Copyright: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

Reuse: Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Developing a minimum dataset for nursing team leader handover in the intensive care unit: A focus group study

Amy J. Spooner RN, BN, Grad Dip ICU, PhD (Candidate)^{a,c},

Leanne M. Aitken Int Care Cert, B HSc (Nurs) Hons, Grad Cert Mgt, Grad Dip Sc Med (Clin Epi), PhD, FACN, FAAN^{b,c,d,e}

Amanda Corley, RN, BN, Grad Cert HSc (Nurs), MAdvPrac (Research)^a,

Wendy Chaboyer RN, BSc (Nurs) Honours, MN, PhD^b

^aThe Prince Charles Hospital, Critical Care Research Group, Intensive Care Unit, The Prince Charles Hospital, Brisbane, Australia.

^bNHMRC Centre of Research Excellence in Nursing, Menzies Health Institute Queensland, Griffith University, Gold Coast, Australia.

^cSchool of Nursing and Midwifery, Griffith University, Nathan, Australia.

^dIntensive Care Unit, Princess Alexandra Hospital, Woolloongabba, Australia

^eSchool of Health Sciences, City University London, London, United Kingdom.

Corresponding author at:

Amy Spooner

The Prince Charles Hospital

Level 5 CSB, Room 6,

Rode Rd, Chermside. 4032.

amyjspooner@gmail.com

(07) 3139 5280

Key words:

Clinical handover, intensive care unit, minimum dataset, intensive care

Author contribution:

All authors declare that this manuscript is original, has not been published before and is not currently being considered for publication elsewhere. We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us. We understand that the Corresponding Author is the sole contact for the Editorial process. She is responsible for communicating with the other authors about progress, submissions of revisions and final approval of proofs.

Abstract

Background

Despite increasing demand for structured processes to guide clinical handover, nursing handover tools are limited in the intensive care unit.

Objectives

The study aim was to identify key items to include in a minimum dataset for intensive care nursing team leader shift-to-shift handover.

Methods

This focus group study was conducted in a 21-bed medical/surgical intensive care unit in Australia. Senior registered nurses involved in team leader handovers were recruited. Focus groups were conducted using a nominal group technique to generate and prioritise minimum dataset items. Nurses were presented with content from previous team leader handovers and asked to select which content items to include in a minimum dataset. Participant responses were summarised as frequencies and percentages.

Results

Seventeen senior nurses participated in three focus groups. Participants agreed that ISBAR (Identify-Situation-Background-Assessment-Recommendations) was a useful tool to guide clinical handover. Items recommended to be included in the minimum dataset ($\geq 65\%$ agreement) included *Identify* (Name, age, days in intensive care), *Situation* (Diagnosis, surgical procedure), *Background* (Significant event(s), management of significant event(s)) and *Recommendations* (Patient plan for next shift, tasks to follow up for next shift). Overall, 30 of the 67 (45%) items in the *Assessment* category were considered important to include in the minimum dataset and focused on relevant observations and treatment within each body

system. Other non-ISBAR items considered important to include related to the ICU (Admissions to ICU, staffing/skill mix, theatre cases) and patients (Infectious status, site of infection, end of life plan). Items were further categorised into those to include in all handovers and those to discuss only when relevant to the patient.

Conclusions

The findings suggest a minimum dataset for intensive care nursing team leader shift-to-shift handover should contain items within ISBAR along with unit and patient specific information to maintain continuity of care and patient safety across shift changes.

1. INTRODUCTION

Adverse patient incidents associated with miscommunication during clinical handover remains a recurring problem nationally and globally in healthcare.¹⁻⁴ Breakdown in communication accounted for 20% of all reported sentinel events in Queensland (Australia) public hospitals between 2005 and 2006⁴ and the Joint Commission recently reported that poor communication is the leading cause of all sentinel events and that more than one third of all patient handoffs are defective.⁵ Gaps in communication has been linked to delays in diagnosis, patients receiving the wrong treatment, breakdown in continuity of care and life threatening adverse events leading to longer hospital stays and increased healthcare expenditure.⁶ In Australia, clinical handover is listed as a priority area for patient safety improvement, and has led to the roll out of the National Safety Quality Health Service Standard (NSQHSS) 6 - Clinical handover.⁷ To fulfill accreditation standards healthcare organisations are required to have structured handover processes in place, including a minimum dataset (MDS) to handover patient information. Growing awareness of this patient safety issue has led to the development of a wide range of handover resources with an increasing evidence base in this important area.^{8, 9}

The introduction of standardised handover processes ensures all participants know the process and content required to present complex patient information.⁹ Part of the standardised process includes the incorporation of structured handover tools that enable clinicians to deliver handover in a structured format. Commonly used handover tools include SBAR (Situation-Background-Assessment-Recommendation), I-PASS (Illness severity-Patient summary-Action list-Situation awareness-Synthesis by receiver) and SHARED (Situation-History-Assessment-Risk-Expectation-Documentation). While the use of structured handover tools has been linked to improved continuity of care and patient outcomes,^{6, 10, 11} not all handover tools can be successfully used across all clinical settings. This may be due to the tools containing too much or not enough information, or content that is not applicable

to the clinical context. Health care facilities vary widely and have differing functions and size in relation to service delivery, location and workforce.⁷ One solution is to utilise flexible standardisation which involves either adapting an established framework or developing a minimum dataset (MDS) that contains content pertinent to the clinical context.^{6, 10, 12, 13} Recent studies indicate that standardised handover processes encourages more effective handover^{10, 12, 14} and positive patient outcomes.¹¹ In particular, there are reports of improved handovers, with fewer technical errors,¹⁵ enhanced clinical performance and clinicians reporting greater knowledge of patients;^{14, 16} higher satisfaction amongst patients;^{14, 16} improved patient safety and reduced costs to the healthcare system.^{6, 11}

Despite the availability of a variety of structured handover tools, transferability to the intensive care unit (ICU) can be challenging. The ICU is an event-driven, time-pressured environment prone to continuous distractions. Patients are critically ill and require timely care at a moment's notice.¹⁷ The complex and multidisciplinary nature of the ICU renders it susceptible to healthcare errors. Handovers occur frequently in the ICU (e.g., change of shift, meal breaks, admissions, transfers) amongst members of a multidisciplinary team (nurses, doctors and allied health staff). Despite a growing body of research focusing on handovers in adult and pediatric ICUs, relating to admissions to the ICU from the emergency department¹⁸ or operating theatre,^{15, 19-21} nursing bedside shift-to-shift handover²² and transfers from ICU to the ward,^{12, 23} little is known about ICU nursing team leader shift-to-shift handover. Unlike bedside nurses that care for one or two patients per shift and discuss detailed patient information at handover, nursing team leaders oversee care provided by bedside nurses, are responsible for the coordination and management of multiple critically ill patients in the ICU and require a succinct overview of patient information. Informative handovers are critical to maintaining patient continuity, safety and a high standard of care, however no structured process for nursing team leader shift-to-shift handover currently exists. Evidence based handover strategies are urgently required to improve communication transfer during

handover to avoid unnecessary patient harm. Therefore, the aim of this study was to identify the key items to include in a MDS for nursing team leader shift-to-shift handover in the ICU.

METHODS

This focus group study was conducted over two days during February 2014 in a 21-bed (government funded) adult medical/surgical ICU, specialising in cardiothoracic surgery at a tertiary referral hospital, in Queensland, Australia. Ethical approval was obtained by the institutional and (HREC/10/QPCH/5) and university (NRS/09/13) Human Research Ethics Committee.

Setting

There were 180 registered nurses employed in the ICU including 63 senior registered nurses working in team leader roles. The ICU consists of three areas (ICU 1- cardiac surgical, ICU 2/3 – general); each area containing up to nine beds coordinated by one team leader. Handovers occur at the nurses' station with a maximum of nine patients discussed by each team leader. The ISBAR (Identify-Situation-Background-Assessment-Recommendation) schema was the hospital's approved handover tool to conduct clinical handover at the study site. The ISBAR schema is widely used in healthcare settings^{24, 25} and has undergone extensive testing.^{24, 26} Despite having an approved handover tool at the study site, no standardised or evidence based handover tools were being used. Prior to commencing this study, team leaders could choose up to five different templates that were either developed by individual staff members or printed from an electronic computer system. Team leaders in the two general ICUs predominantly used a template containing the body systems (e.g., Central nervous system, respiratory system, cardiovascular system etc.), the registrars weekly patient summary or a printed template from the hospital computer system (WardView provides a brief summary of the patient's demographics and medical status). Team leaders in the cardiac surgical ICU often used a paper template with a cardiac surgical focus (e.g., surgery type, surgeon, cardiac drainage etc) and/or a template containing the patient's medical history and

clinical events. Although the templates are vastly different they all contained patient identifiers (name, bed number).

Participants

Senior ICU registered nurses (Grade 5, 6 and 7 registered nurses) involved in team leader handover were purposively sampled. Grade 5 nurses have successfully completed the ICU transition program and team leader educational package, grade 6 nurses have completed the ICU transition program, Graduate Certificate in Intensive Care and team leader educational package, while grade 7 nurses have postgraduate qualifications and coordinate the clinical and managerial operation of the unit. All team leaders worked across the three ICU areas. Participant information sheets and consent forms were sent via internal mail to all nursing staff who met the inclusion criteria (Senior ICU registered nurses involved in team leader handover). Potential participants were told about the study at staff meetings and written consent was obtained prior to study commencement. Consent was also confirmed verbally at the time of data collection.

Data collection

Registered nurses involved in team leader handover were invited to attend focus groups. Focus groups occurred over two days, were approximately 90 minutes in length and occurred in a room with space for participants to sit comfortably in a circle to ensure the researcher could maintain eye contact with participants throughout the session. Investigators used a convenience sample to conduct focus groups. As senior nurses working in the ICU were required to leave the unit for an extended period of time, the number of staff available to attend focus groups was dependent on the busyness (patient numbers, patient acuity) and staffing levels (sick calls, skill mix and the availability of staff to cover each other) of the ICU on the study day. Demographic data collected included gender, nursing grade and hours worked per fortnight.

To ensure all participants contributed during the session a nominal group technique (NGT)²⁷⁻²⁹ was used to guide the focus groups. NGT is a structured method, recognised as an efficient and effective methodology to generate and prioritise ideas.^{27, 29, 30} In NGT, data are systematically collected from all participants to ensure divergent views are reflected in the data. The process prevents the domination of discussion by a single person, encourages passive group members to participate, and results in a set of prioritised solutions or recommendations. NGT assisted the researchers to determine which concepts to include in a MDS for ICU team leader handover.

Focus groups were structured using Keatinge's²⁷ NGT to generate data (Figure 1). To commence the NG meeting, an investigator (AS) (the facilitator) clarified the purpose of the meeting, expectations of the participants, asked open ended questions and kept the conversation moving.³¹ A second investigator (TB) audiotaped the discussions; observed the group and made field notes to complement the audio recordings.³² Handouts were given to participants containing content items from team leader handovers. Content within the ISBAR schema, along with additional unit and patient specific content was presented to participants. Using a round robin technique (i.e. each participant takes a turn), participants were asked to state which items from the handout to include/remove from a MDS. Responses were summarised and participants had a final vote on content items to include in a MDS. Participants were asked to suggest additional content items to include in a MDS. A round robin was conducted, responses shared and participants voted and decided which items should be included in a MDS. A final summary of the responses was presented, participants clarified/suggested final recommendations during a round robin and a final vote resulted in a MDS for team leader handover.

Data analysis

Descriptive statistics were used to provide a summary of key items to include in a MDS for nursing team leader handover. Data are presented as frequencies and percentages.³³

Audiotapes and field notes from the meeting were used to clarify inconsistencies and further explain data generated. Participants suggested that content could be further stratified into items to include in all handovers and items to include if relevant to the patient e.g., temperature value if the patient was hypo/hyper thermic, wounds if present. Investigators set an agreement threshold at $\geq 65\%$, as achieving 2/3 agreement within each of the focus groups was considered appropriate.

RESULTS

Seventeen senior nurses (two males and 15 females) involved in team leader handover consented to participate in focus groups. Three focus groups were conducted containing four, six and seven nurses in each group. Participants included one grade seven nurse, seven grade six nurses and nine grade 5 nurses. Forty-one percent (7) of participants worked full-time in the ICU.

ISBAR items

Specific items within *Identify* (Name, age, days in ICU), *Situation* (Diagnosis, surgical procedure), *Background* (Significant event/s and management of significant event/s) and *Recommendations* (Patient plan for the next shift, tasks team leader needs to follow up for next shift) were recommended to be included in a MDS. Patient consultations (e.g., Occupational therapist) and/referrals (e.g., mental health review) within the *Recommendation* category were suggested only when they were relevant to the patient. All content items within ISBR of the ISBAR schema are presented in Table 1, while the *Assessment* items are summarised in Table 2.

Within the *Assessment* category, participants identified specific content within each body system (central nervous system, respiratory system, cardiovascular system, renal system, gastrointestinal tract system, skin system and social system) to be included in a MDS (Table 2). Overall, 12 of the 67 (18%) items in the *Assessment* category were considered important

to include in a MDS, while 18 of the 67 (27%) items were considered important to include only when relevant to the patient e.g., oxygen saturation was important to include if the patient was weaning from ventilation or was having difficulty maintaining optimal oxygenation levels. *Assessment* items with $\geq 65\%$ agreement amongst participants with 'Include' or 'Include if applicable' responses are identified in table 2. *Assessment* items with $< 65\%$ in either the 'include' or 'include if applicable' are shown in Supplementary table 1.

Non-ISBAR items

There were other items not related to the ISBAR mnemonic that participants considered important to include in a MDS (Table 3). These included *unit flow and management* (Admissions to ICU, staffing/skill mix, theatre cases), *patient alerts* (Infectious status, site of infection) and *additional patient updates* (End of life plan), while *unit administrative tasks* such as dangerous drug orders, equipment issues and patient menus/orders completed were not considered necessary to discuss at handover. Items within the *additional patient updates* category (Patient behavior, scheduled investigations) were considered important to include in handover only if relevant to the patient.

Additional patient updates to be included in handover

Participants were asked to suggest other items that could be included in a MDS. Although several items were discussed during focus groups, only two additional items – patient's surgeon (17/17, 100%) and ICU consultant in charge for the week/weekend (11/17, 65%) achieved consensus for inclusion in the MDS.

2. DISCUSSION

This study identified content for inclusion in a MDS for nursing team leader shift-to-shift handover. Content included items within the ISBAR schema, non-ISBAR and additional items recommended by team leaders. Nursing team leaders identified content that should be

included in all shift-to-shift handovers and content that could be included in handovers if relevant/pertinent to the patient. Items relevant to all handovers tended to focus on the summary of patient management (e.g., significant event(s), management of significant event(s), current health assessment, future patient plans and organisational issues). Further detail within patient health assessments was deemed important to include in handovers if relevant to the patient (e.g., renal replacement therapy, dressing regime for wounds).

Through engaging the nurses involved in handover the investigators were able to identify key items to include in a MDS for nursing team leader handover. Engaging key stakeholders in the development of interventions such as a MDS for team leader handover is crucial to ensuring the intervention is relevant to the clinical context, meets the needs of the users and can be successfully implemented and utilised.³⁴ While it is important to engage the key users when developing an intervention for practice change it is also imperative that the intervention meets the local/national/international standards and guidelines to ensure high standards of care and patient safety is maintained.⁷ Our research identified several content items within the ISBAR schema that team leaders did not consider necessary to include in handover that are mandatory items within the NSQHSS 6. These items include patient bed number, admitting consultant/team (*Identify*); acute resuscitation plans, discharge status (*Situation*); and medical, surgical history (*Background*).

The ISBAR schema is one of several tools recommended by the ACSQHC to help guide clinicians with the transfer of patient information during handover and was the approved tool to use for handover at the study site.⁸ To adequately *Identify* a patient during handover three forms of identity (patient name, date of birth and medical identification number) are recommended to avoid misidentification and mismatching of patient management.⁷ A previous study conducted in the ICU found that medical identification number was not mentioned during team leader handovers³⁵ and nor was it recommended for inclusion during focus groups in this study. In addition, team leaders were impartial when deciding whether bed number should be

included in all handovers or included if applicable to the patient. Team leaders also considered the inclusion of admitting medical consultant/team to be unnecessary which could compromise patient outcomes such as causing delays in treatment if the appropriate physician is not notified promptly of changes in patient conditions.

Within the *Situation* category team leaders were impartial as to whether acute resuscitation plan and discharge status should be mentioned in all handovers or only when applicable e.g., some team leaders considered acute resuscitation plan necessary to mention if a specific plan had been documented, otherwise it was not important to mention in handover. Similarly, within the *Background* category of the ISBAR schema team leaders were divided as to whether medical and surgical history should be mentioned in all handovers or only when applicable to the patient. These results show there were varied opinions amongst team leaders regarding the content to include in a MDS. The advantages of structured tools such as MDSs is that they minimise individual biases as to what information is deemed “important”.³⁶ Standardised frameworks are objective and outline the minimum content that must be contained and transferred during handover.^{9, 36} These findings also suggest a lack of awareness or understanding amongst clinicians in relation to current standards and guidelines for the delivery of safe clinical handovers.^{37, 38} While it is important to develop an evidence-based MDS that meets the needs of the clinicians and context, it is also imperative that clinical practice and patient safety is not compromised due to the omission of critical patient information at handover.

Within the *Assessment* category team leaders identified items to include in a MDS for handover. While Spooner et al's³⁵ study identified a large number of items discussed in this category, focus group participants considered less than half of these items to be relevant to include in all handovers or when applicable to the patient. These findings indicate that team leaders would rather obtain a concise summary of the most pertinent patient assessment information. Unlike bedside nurses that handover detailed patient assessment information of

one or two patients, team leaders' handover up to nine patients in the same allocated timeframe. The transition from bedside nurse to team leader may prove challenging when determining what information to discuss in this category at handover. A structured MDS may be a beneficial way to reduce unnecessary content discussed at handover and assist clinicians to prepare and deliver succinct and timely handovers.

Our research showed that alongside the ISBAR schema, participants considered information specific to the unit and patient to be important. The ICU has been identified as one of the major areas where patient flow can be problematic. Once the ICU is at capacity, unless patients are well enough to be transferred to the ward to make a bed available for an admission, patients are unable to be transferred to another area within the hospital and no further patients can be admitted to the ICU. Clinical handovers that contain information regarding patient flow (e.g., planned/emergency admissions into and transfers out of ICU) may assist nursing team leaders to plan and optimise patient flow within the ICU, thereby minimising delays in patients receiving timely and efficient care.³⁹ These findings add to the current literature and inform the development of an evidence-based MDS incorporating a modified ISBAR schema along with specific ICU and patient details required by team leaders to deliver informative shift-to-shift handovers.

Recommendations for practice

The ICU is a high risk environment containing critically ill patients that can become unstable with little warning. Clinicians rely on informative handovers to maintain continuity of care. While there are many resources available for clinicians to assist with the handover process, there are limited resources that can be applied in the ICU setting. It is imperative that handover tools are either modified or MDSs are developed to meet the needs of the clinical context such as ICU to avoid incomplete, inconsistent or inaccurate information that could compromise patient safety.⁹ Furthermore, clinician engagement is essential to ensure MDSs contain information relevant to the setting. Clinician involvement may also increase the

likelihood the tool will be accepted and adopted by clinicians.⁴⁰ Alongside clinician engagement investigators need to also ensure tools comply with local guidelines and national standards. Further work is required to evaluate whether ICU specific MDSs improve handover communication and reduce adverse patient events in the ICU.

Limitations

This study was conducted in one ICU and the sample size was small, however it was representative of all levels of nurses involved in team leader handover. A larger sample size containing more full-time nurses may have provided further insight into the content required in a MDS. Although focus groups are a valuable way to obtain a large amount of information in a short timeframe, group dynamics and varying opinions can silence participants. To ensure all participants contributed during focus groups a NGT was utilised to structure the sessions, promote rich discussions and allow individuals to be heard.

3. CONCLUSION

Our research findings identified items within the ISBAR schema and additional items necessary to include in a MDS for ICU nursing team leader shift-to-shift handover. Specific items were proposed for inclusion in all clinical handovers, while other items were considered only necessary to discuss if relevant to the patient. These findings will inform the development of the first evidence-based MDS for nursing team leader handover in the ICU. This MDS may be adaptable to other hospital ICUs that lack structured, evidence based resources to guide the handover of critical patient information. Our MDS aims to provide a structured, informative handover that assists team leaders to maintain continuity of care and provide patients with a high standard of care.

ACKNOWLEDGEMENTS

The investigators would like to thank the Nursing Director, Clinical Nurse Consultant, Quality and Safety nurse, Medical Director and nursing staff from the ICU for their support, encouragement and participation in this project.

FUNDING

This work was supported by an Australian Centre for Health Services Innovation (AusHSI) grant and the Babe Norman PhD Scholarship awarded by the Nurses Memorial Centre which is greatly appreciated.

REFERENCES

1. Johnson, J.K., Arora, V.M. Improving clinical handovers: Creating local solutions for a global problem. *Qual Saf Health Care*; 2009;**18** (4): 244-245.
2. Thomas, M.J., Schultz, T.J., Hannaford, N., Runciman, W.B. Failures in transition: Learning from incidents relating to clinical handover in acute care. *J Healthc Qual*; 2013;**35** (3): 49-56.
3. Australian Commission on Safety and Quality in Health Care. *Clinical handover*. ACSQHC, Sydney; 2008. <http://www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-05> (9 October 2015)
4. World Health Organization. Communication during patient hand-overs. *Patient safety solutions*; 2007;**1** (3).
5. Joint commission on accreditation of healthcare organizations. *Joint commission center for transforming healthcare releases targeted solutions tool for hand-off communications*. Joint commission perspectives, 2012. http://www.jointcommission.org/assets/1/6/TST_HOC_Persp_08_12.pdf (31 October 2016)
6. Ahmed, J., Mehmood, S., Rehman, S., Ilyas, C., Khan, L.U. Impact of a structured template and staff training on compliance and quality of clinical handover. *Int J Surg*; 2012;**10** (9): 571-574.
7. Australian Commission on Safety and Quality in Healthcare. *Safety and quality improvement guide standard 6*. ACSQHC, Sydney; 2012.
8. Australian Commission on Safety and Quality in Health Care. *Implementation toolkit for clinical handover improvement*. ACSQHC, Sydney; 2011.
9. Australian Commission on Safety and Quality in Health Care. *Ossie guide to clinical handover improvement*. ACSQHC, Sydney; 2010.
10. Yee, K.C., Wong, M.C., Turner, P. "Hand me an isobar": A pilot study of an evidence-based approach to improving shift-to-shift clinical handover. *Med J Aust*; 2009;**190** (11 Suppl): S121-124.
11. Agarwal, H.S., Saville, B.R., Slayton, J.M., Donahue, B.S., Daves, S., Christian, K.G., et al. Standardized postoperative handover process improves outcomes in the intensive care unit: A model for operational sustainability and improved team performance*. *Crit Care Med*; 2012;**40** (7): 2109-2115.
12. Graan, S.M., Botti, M., Wood, B., Redley, B. Nursing handover from icu to cardiac ward: Standardised tools to reduce safety risks. *Aust Crit Care*; 2016;**29** (3): 165-171.
13. Gardiner, T.M., Marshall, A.P., Gillespie, B.M. Clinical handover of the critically ill postoperative patient: An integrative review. *Aust Crit Care*; 2015;**28** (4): 226-234.
14. Riesenber, L.A., Leitzsch, J., Cunningham, J.M. Nursing handoffs: A systematic review of the literature. *Am J Nurs*; 2010;**110** (4): 24-34; quiz 35-26.
15. Catchpole, K.R., de Leval, M.R., McEwan, A., Pigott, N., Elliott, M.J., McQuillan, A., et al. Patient handover from surgery to intensive care: Using formula 1 pit-stop and aviation models to improve safety and quality. *Paediatr Anaesth*; 2007;**17** (5): 470-478.
16. Thomas, L., Donohue-Porter, P. Blending evidence and innovation: Improving intershift handoffs in a multihospital setting. *J Nurs Care Qual*; 2012;**27** (2): 116-124.
17. Smith, A.F., Pope, C., Goodwin, D., Mort, M. Interprofessional handover and patient safety in anaesthesia: Observational study of handovers in the recovery room. *Br J Anaesth*; 2008;**101** (3): 332-337.
18. McFetridge, B., Gillespie, M., Goode, D., Melby, V. An exploration of the handover process of critically ill patients between nursing staff from the emergency department and the intensive care unit. *Nurs Crit Care*; 2007;**12** (6): 261-269.
19. Joy, B.F., Elliott, E., Hardy, C., Sullivan, C., Backer, C.L., Kane, J.M. Standardized multidisciplinary protocol improves handover of cardiac surgery patients to the intensive care unit. *Pediatr Crit Care Med*; 2011;**12** (3): 304-308.

20. Segall, N., Bonifacio, A.S., Schroeder, R.A., Barbeito, A., Rogers, D., Thornlow, D.K., et al. Can we make postoperative patient handovers safer? A systematic review of the literature. *Anesth Analg*; 2012;**115** (1): 102-115.
21. Kaufmann, J., Twite, M., Barrett, C., Peyton, C., Koehler, J., Rannie, M., et al. A handoff protocol from the cardiovascular operating room to cardiac icu is associated with improvements in care beyond the immediate postoperative period. *Jt Comm J Qual Patient Saf*; 2013;**39** (7): 306-311.
22. Spooner, A.J., Chaboyer, W., Corley, A., Hammond, N., Fraser, J.F. Understanding current intensive care unit nursing handover practices. *Int J Nurs Pract*; 2013;**19** (2): 214-220.
23. van Sluisveld, N., Hesselink, G., van der Hoeven, J.G., Westert, G., Wollersheim, H., Zegers, M. Improving clinical handover between intensive care unit and general ward professionals at intensive care unit discharge. *Intensive Care Med*; 2015;**41** (4): 589-604.
24. Woodhall, L.J., Vertacnik, L., McLaughlin, M. Implementation of the sbar communication technique in a tertiary center. *J Emerg Nurs*; 2008;**34** (4): 314-317.
25. Haig, K.M., Sutton, S., Whittington, J. Sbar: A shared mental model for improving communication between clinicians. *Jt Comm J Qual Patient Saf*; 2006;**32** (3): 167-175.
26. Thompson, J.E., Collett, L.W., Langbart, M.J., Purcell, N.J., Boyd, S.M., Yuminaga, Y., et al. Using the isbar handover tool in junior medical officer handover: A study in an Australian tertiary hospital. *Postgrad Med J*; 2011;**87** (1027): 340-344.
27. Keatinge, D. Identifying service needs of children with disruptive behavior problems using a nominal group technique. *Nurs Hlth Sci*; 2000;**2**: 179-189.
28. Potter, M., Gordon, S., Hamer, P. The nominal group technique: A useful consensus methodology in physiotherapy research. *NZ Journal of Physiotherapy*; 2004;**32** (3).
29. Harvey, N., Holmes, C.A. Nominal group technique: An effective method for obtaining group consensus. *Int J Nurs Pract*; 2012;**18** (2): 188-194.
30. Asmus, C.L., James, K. Nominal group technique, social loafing, and group creative project quality. *Creat Res J*; 2005;**17** (4): 349-354.
31. Gibbs, A. Focus groups. University of Surrey, Guilford; 1997.
32. Bender, D.E., Ewbank, D. The focus group as a tool for health research: Issues in design and analysis. *Health Transit Rev*; 1994;**4** (1): 63-80.
33. Fink, A. How to conduct surveys: A step-by-step guide. Sage., Los Angeles; 2009.
34. Siriwardena, A.N. Engaging clinicians in quality improvement initiatives: Art or science? *Qual Prim Care*; 2009;**17** (5): 303-305.
35. Spooner, A.J., Aitken, L.M., Corley, A., Fraser, J.F., Chaboyer, W. Nursing team leader handover in the intensive care unit contains diverse and inconsistent content: An observational study. *Int J Nurs Stud*; 2016;**61**: 165-172.
36. Keebler, J.R., Lazzara, E.H., Patzer, B.S., Palmer, E.M., Plummer, J.P., Smith, D.C., et al. Meta-analyses of the effects of standardized handoff protocols on patient, provider, and organizational outcomes. *Hum Factors*; 2016;**58** (8): 1187-1205.
37. Cabana, M.D., Rand, C.S., Powe, N.R., Wu, A.W., Wilson, M.H., Abboud, P.A., et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA*; 1999;**282** (15): 1458-1465.
38. Leone, M., Ragonnet, B., Alonso, S., Allaouchiche, B., Constantin, J.M., Jaber, S., et al. Variable compliance with clinical practice guidelines identified in a 1-day audit at 66 French adult intensive care units. *Crit Care Med*; 2012;**40** (12): 3189-3195.
39. Institute for Healthcare Improvement. Optimizing patient flow: Moving patients smoothly through acute care settings. *IHI Innovation Series white paper*; 2003.
40. Lewin, K. Resolving social conflict/field theory in social science. American Psychological Association, Washington, DC; 1997.

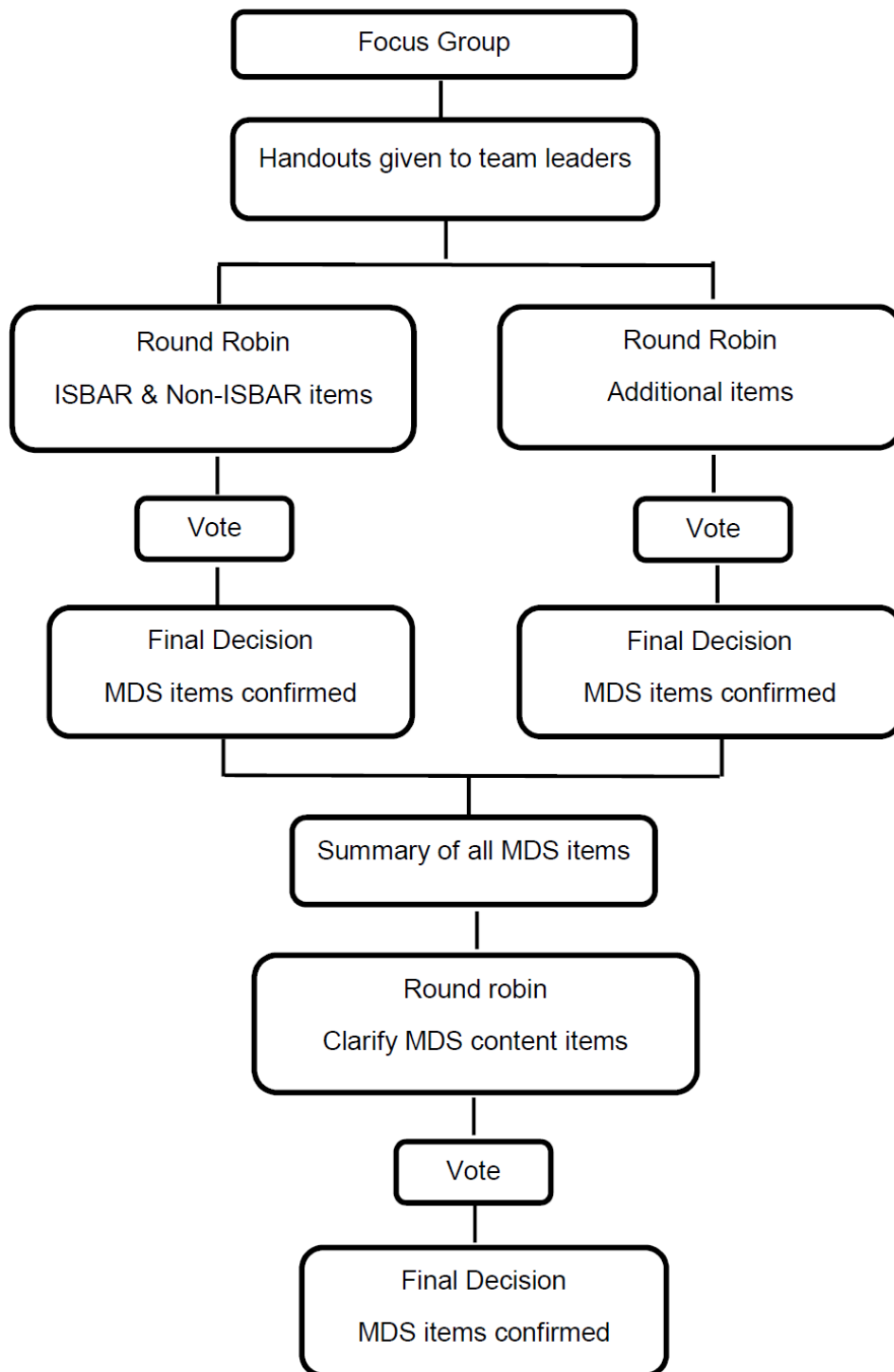


Figure 1 Process of the nominal group technique

Table 1 ISBR (Identify-Situation-Background-Recommendations) items

Categories/sub-categories n=17	Include Frequency (%)	Include if applicable Frequency (%)
<i>Identify</i>		
Name	17 (100)	0
Age	17 (100)	0
Days in intensive care unit	17 (100)	0
Bed number	7 (41)	6 (35)
Admitting consultant/team	3 (18)	7 (41)
<i>Situation</i>		
Diagnosis	15 (88)	2 (12)
Surgical procedure	11 (65)	6 (35)
Acute resuscitation plan ⁺	10 (59)	7 (41)
Discharge status	7 (41)	10 (59)
<i>Background</i>		
Medical history	7 (41)	10 (59)
Surgical history	7 (41)	10 (59)
Significant event/s	17 (100)	0
Management of significant event/s	17 (100)	0
<i>Assessment</i>		
Presented in table 2 and Supplementary table 1		
<i>Recommendations</i>		
Consultations/referrals to specialists (conducted in previous shift/planned for next shift)	6 (35)	11 (65)
Patient plan for next shift/s (determined by daily clinical ward round)	16 (94)	1 (6)
Items team leader needs to follow up for next shift	17 (100)	0

⁺Acute resuscitation plan includes plan for response to life threatening situation (e.g. not for reintubation and one defibrillator shock).

Table 2 Assessment items ≥65% agreement

Categories/Sub-categories n=17	Include Frequency (%)	Include if applicable Frequency (%)
<i>Assessment (≥65% agreement)</i>		
Central nervous system		
Sedation	14 (82)	3 (18)
Respiratory system		
Acknowledges respiratory system	17 (100)	0
Abnormal arterial blood gas results	17 (100)	0
Oxygen saturation	0	17 (100)
Cardiovascular system		
Acknowledges cardiovascular system	16 (94)	1 (6)
Rhythm	17 (100)	0
Rhythm management	5 (29)	12 (71)
Infusions	16 (94)	1 (6)
Heparin/Warfarin	15 (88)	1 (6)
Reason for Heparin/Warfarin	16 (94)	1 (6)
Blood products	15 (88)	2 (12)
Blood pressure	1 (6)	16 (94)
Central venous pressure	0	14 (82)
Temperature	1 (6)	16 (94)
Hemoglobin level	0	17 (100)
Potassium level	1 (6)	14 (82)
Gastrointestinal tract system		
Acknowledges gastrointestinal tract system	17 (100)	0
High nasogastric aspirates	15 (88)	1 (6)
Bowels	0	16 (94)
Diet	1 (6)	12 (71)
Blood sugar levels	0	14 (82)
Renal system		
Renal replacement therapy	0	17 (100)
Renal replacement therapy mode/aims	0	17 (100)
Urine output	4 (24)	13 (76)
Urea and Creatinine test results	3 (18)	11 (65)
Skin system		
Wounds present	0	17 (100)
Dressing regime	0	17 (100)
Age of intravascular devices	0	13 (76)
Social system		
Family situation	0	17 (100)
Family meeting	11 (65)	6 (35)

Table 3 – Non-ISBAR items

Categories/sub-categories n=17	Include Frequency (%)	Include if applicable Frequency (%)
<i>Unit specific information</i>		
Unit flow and management		
Admissions to ICU	16 (94)	1 (6)
Bed movements	4 (24)	0
Staffing/skill mix	17 (100)	0
Theatre cases	17 (100)	0
Unit administrative tasks		
Dangerous drug orders	0	4 (24)
Equipment issues	9 (53)	0
Patient menus/orders completed	0	0
<i>Patient specific information</i>		
<i>Patient alerts</i>		
Allergies	7 (41)	5 (29)
Falls risk	0	5 (29)
Infectious status	17 (100)	0
Site of infection	16 (94)	0
Precautions	0	4 (24)
PRIME clinical incident reporting system	1 (6)	10 (59)
Additional patient updates		
Antibiotics	1 (6)	6 (35)
End of life plan*	17 (100)	0
Mobility	1 (6)	8 (47)
Patient behavior	0	17 (100)
Patient weight	0	6 (35)
Scheduled investigations	0	17 (100)
Patient consent to follow up	2 (12)	3 (18)
Patient on research study	0	0

*End of life care includes broader plan for dying patient (e.g., pain relief, feeding regime, family involvement in care).

Supplementary Table 1 Assessment items with <65% agreement (n=17 participants)

ISBAR schema Categories/Sub-categories n=17	Include Frequency (%)	Include if applicable Frequency (%)
<i>Assessment (<65% agreement)</i>		
Central nervous system		
Refers to Central Nervous System	7 (41)	4 (24)
Glasgow Coma Scale	7 (41)	8 (47)
Pupil Reaction	2 (12)	10 (59)
Limb powers	1 (6)	8 (47)
Sleeping status	4 (24)	10 (59)
Paralysis medication	10 (59)	5 (29)
Train of Four score	3 (18)	4 (24)
Bispectral Index	0 (0)	1 (6)
Pain level	7 (41)	5 (29)
Pain management	8 (47)	3 (18)
Respiratory system		
Extubation status	10 (59)	7 (41)
Airway grade	7 (41)	9 (53)
Ventilation settings	0 (59)	10 (59)
Oxygen delivery device	8 (47)	2 (12)
Ventilation/parameters	0 (0)	10 (59)
Respiratory rate	0 (0)	10 (59)
Sputum	0 (0)	7 (41)
Normal arterial blood gas results	0 (0)	0 (0)
Cardiovascular system		
Pacing wires	10 (59)	6 (35)
Pacing mode	10 (59)	7 (41)
Blood pressure aims/management	5 (29)	10 (59)
Cardiac drainage	7 (41)	10 (59)
Ventricular assist device settings	5 (29)	5 (29)
Circulation	9 (53)	8 (47)
APTT/INR results	3 (18)	2 (12)
Time APTT/INR due	4 (24)	2 (12)
Gastrointestinal tract system		
Nasogastric/orogastric tube present	1 (6)	6 (35)
Management of high gastric aspirates	2 (12)	6 (35)
Nausea/vomiting	0 (0)	1 (6)
Management of abnormal blood sugars	5 (29)	7 (41)
Renal system		
Management of urine output	8 (48)	9 (52)
Refers to indwelling catheter	0 (0)	6 (35)
Full blood count results	1 (6)	9 (53)
Skin system		
Pressure areas present	10 (59)	7 (41)
Wound chart	0 (0)	0 (0)
PRIME incident reports	5 (29)	7 (41)
Hygiene cares	0 (0)	0 (0)