

BMJ Open Quality Improving physician handover documentation process for patient transfer from paediatric intensive care unit to general ward

Hamza Alali ^{1,2}, Mohannad Antar,^{1,2} Ali AlShehri,^{1,2,3} Ousaima AlHamouieh,⁴ Khaled Al-Surimi,^{2,5} Yasser Kazzaz ^{1,2,3}

To cite: Alali H, Antar M, AlShehri A, *et al*. Improving physician handover documentation process for patient transfer from paediatric intensive care unit to general ward. *BMJ Open Quality* 2020;**9**:e001020. doi:10.1136/bmjopen-2020-001020

► Additional material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2020-001020>).

Received 16 May 2020

Revised 17 November 2020

Accepted 22 November 2020



© Author(s) (or their employer(s)) 2020. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

¹Pediatrics, Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia

²King Abdullah International Medical Research Center, Riyadh, Saudi Arabia

³College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

⁴Quality and Patient Safety, Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia

⁵Public Health and Health Informatics, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

Correspondence to

Dr Hamza Alali;
drhamza80@hotmail.com

ABSTRACT

Background Inadequate handover communication is responsible for many adverse events during the transfer of care, which can be attributed to many factors, including incomplete documentation or lack of standardised documentation process. The quality improvement project aimed to standardise the handover documentation process during patient transfer from paediatric intensive care unit (PICU) to the general paediatric ward.

Methods Data analysis revealed lack of proper handover documentation with the omission of vital information when transferring patients from PICU to general ward. The quality improvement team assessed the current handover documentation practice using a brainstorming technique during multiple meetings. The team evaluated the process for possible causes of incomplete handover documentation, framed the existing challenges, and proposed improvement interventions, including a standardised handover form and conducting education sessions for the new proposed process. The main quality measures included physician's compliance with handover documentation elements, physician's satisfaction and PICU emergency readmission rate within 48 hours.

Results Physician compliance to handover documentation improved from 29.5% to 95.5% before and after implanting the improvement interventions, respectively. The level of physician satisfaction with the quality of communicated information during the handover process improved from 47.5% to 84%, and the PICU emergency readmission rate declined from 3.8% to zero after all improvement interventions were implanted.

Conclusion Implementation of standardised handover form is essential to improve physician compliance for clear handover documentation and to avoid data omission during the patient transfer process. Documented handover in patient's medical record has positive impact on physician satisfaction when managing patients recently discharged from PICU.

INTRODUCTION

Patient handover is a real-time process of transferring patient-specific information from one caregiver or team to another to ensure the continuity and safety of a patient's care.¹ Inadequate handover communication is responsible for many adverse events,

including delay in treatment, wrong site surgery and medication errors.²⁻³ Several factors were found responsible for handover communication failures, such as lack of proper healthcare provider training, language barriers, cultural considerations and incomplete or non-existent documentation.³⁻⁴ Several studies have reported that poor handover documentation resulted in content omissions during handover, and some of these omitted contents are vital information (eg, active medical challenges, current clinical status, recent significant events and pending investigations).²⁻⁵ Despite the complexity of the handover process, a written handover document in a patient's record is still an acceptable method to improve the quality of information communicated during patient transfer between different types of care.⁶⁻⁷ The handover of patient care from a critical care area is more complex than regular; hence, standardising the paediatric intensive care unit (PICU) patient handover process and communicated information is vital. We aimed to standardise PICU handover documentation to avoid any possible negative adverse events that may impact patient safety during the PICU patient transfer process to the general paediatric wards.

PROBLEM CONTEXT

This quality improvement (QI) project aimed to standardise the handover documentation process during patient transfer from PICU to the general paediatric ward in a tertiary hospital of King Abdullah Specialized Children Hospital in King Abdul-Aziz Medical City, Riyadh, Saudi Arabia. The bed capacity of the hospital is currently 220, with 25 beds assigned to a closed medical and surgical PICU, which has approximately 1000 admissions per year. Before a patient is transferred from the PICU, verbal communication

between the PICU physician and receiving team in paediatric ward takes place to endorse patient condition and plan a documented transfer summary in the patient's electronic medical record (EMR) by a PICU resident/fellow, containing the problem list, PICU course, investigations and plan of management. However, we received several concerns from the receiving teams regarding the lack of proper documentation and missing integral data during the transfer process of the PICU patient. These concerns lead to form a QI team to conduct an objective assessment of the current handover process among physicians. The analysis confirmed team concerns and highlighted a poor compliance in the documentation of the patient's handover, including missing integral information that might lead to safety issues during the transfer process. Reviewing randomly selected sample of patients' files showed that only less than one-third of children transferred from the PICU had a documented handover summary, and many of these summaries were poorly written with omitted important content like PICU course and plan of management. Thus, we aimed to implement a standardised handover documentation form and improve physician compliance with this new form to achieve a minimum 90% compliance rate within 9 months.

IMPROVEMENT METHODS

A multidisciplinary QI team, composed of three qualified PICU physicians (two consultants and an assistant consultant) and QI facilitator, has been formed to evaluate the magnitude of the issue. Brainstorming during regular QI team meetings analysed the causes and framed the existing challenges. Open freewheeling discussions proposed and prioritised the change ideas, agreed on measures before and after the improvement interventions were implanted, and set the timeframe for execution. Many issues were identified as possible causes for poor handover documentation during the brainstorming meetings, such as lack of standardised handover form in the patient's EMR and lack of clear policy guidance for handover documentation process. Residents' workload,

transfers after hours and the complexity of recently recovered PICU cases were additional barriers in documenting a proper handover during patient transfer from the PICU; see [figure 1](#).

Measures

Project process measure was physician's compliance to the standard handover documentation form elements. This form was evaluated by two PICU qualified physicians for the existence and quality of its standard elements. Outcome measures included receiving physician's satisfaction with the new handover documentation form as the primary outcome and PICU emergency readmission rate within 48 hours as a secondary outcome. A survey using the Likert scale was distributed to paediatric receiving physicians involved in the handover process, evaluating their level of satisfaction with the quality of communicated information before and after implementing standardised handover documentation in patient's EMR. PICU emergency readmission rate within 48 hours is one of our PICU key performance indicators that is regularly monitored in monthly periods. It is calculated as the number of emergency readmissions within 48 hours from the time of discharge divided by the number of PICU discharges during the reporting period.⁸

Improvement interventions

The analysing team identified the modifiable causes for poor handover documentation and directed the improvement interventions towards these causes; see [figure 1](#). The first change idea in improvement was the implementation of standardised handover form in EMR. This form was approved by the QI, PICU consultants and senior physicians, and it contained the following elements: source of PICU admission, reason for PICU admission, problem list, clinical assessment on admission, PICU course, investigations summary, clinical assessment on PICU discharge, consulted services and plan of management (see online supplemental material, PICU patient transfer summary form.pdf). The handover documentation must be completed before the patient's

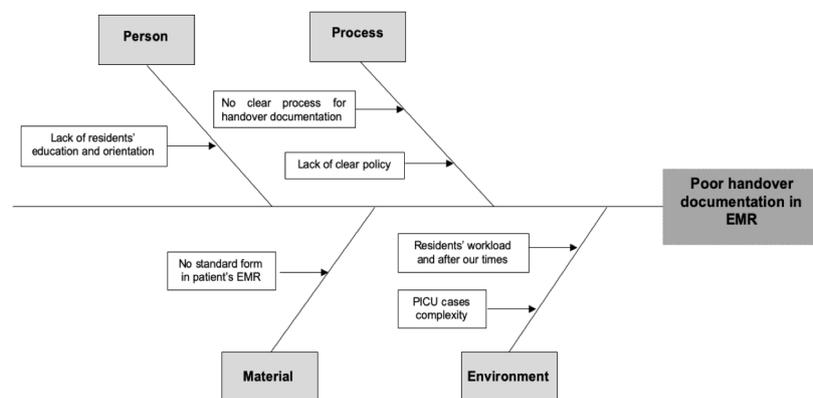


Figure 1 Cause and effect (fishbone) diagram for possible causes of poor handover documentation in patient's electronic medical record (EMR).

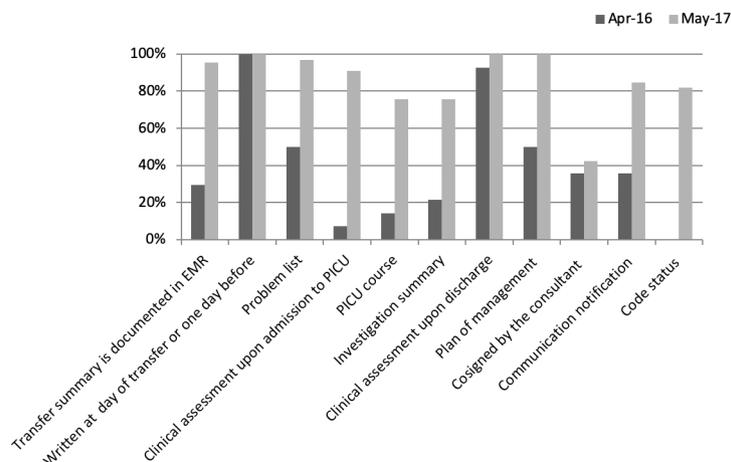


Figure 2 Paediatric intensive care physician's compliance to transfer handover documentation elements. EMR, electronic medical record (EMR); PICU, paediatric intensive care unit.

physical transfer, and reviewed and signed by the PICU senior physician or attending consultant. If the patient was not transferred on the same day (eg, no bed available in general paediatric ward or change in his clinical condition), the handover form should be updated on the day of the patient's transfer. Next, orientation and education should be provided to all PICU staff (physicians, including rotating residents and nurses) about handover documentation form and process. Reeducation sessions were provided as needed. Lastly, to sustain transfer summary completeness, a transfer summary item was added to PICU discharge checklist. Primary nurses were empowered to hold transfers if transfer summary or PICU discharge checklist were not completed. In addition, the process of transfer including transfer summary were added to PICU discharge policy and procedure.

RESULTS

Before the project was initiated, 61 patient files (transferred on April 2016) were reviewed; of which, only 18 files had handover documentation (29.5%) with missed important information, such as problem list, PICU course, and plan of management. After all improvement initiatives were implanted, 68 patient files (transferred on May 2017) were reviewed; of which, 65 had handover documentation (95.5%) with improved compliance to most of the transfer handover elements; see [figure 2](#).

Paediatric receiving physicians before and after implementation of standardised PICU handover documentation form were asked about the presence of handover form as a separate clear document, its quality (contains the needed information and fulfil the standard elements), and their insight about the whole transfer process. More than two-thirds of the responders were residents. Results showed that 84% of responders rated the communicated handover information as good to excellent after the standard handover documentation form implementation, compared with half of preintervention responders who rated it good to excellent. This positive impact resulted

in improved satisfaction with the whole PICU transfer process; see [table 1](#).

PICU emergency readmission rate within 48 hours ranged from 1.2%–3.8% and declined to zero for four consecutive months (March–June 2017) after all improvement interventions took place; see [figure 3](#).

DISCUSSION

Different means of communication were used to relay relevant information during patient handover process in critical care, such as verbal or email communication.^{9 10} In our setting, no clear handover document was to be completed before PICU transfer; however, telephonic communication was completed before the transfer, which was not a standard process, but mostly to inform the receiving team of transfer order documentation rather than a complete formal handover. Standardised handover documentation acts as a framework and guidance for the required information needed to be passed to the next healthcare provider. Although there are known frameworks for the handover, such as I-PASS (illness severity, patient summary, action list, situation awareness, and contingency planning, synthesis by the receiver), SBARR (situation, background, assessment, recommendation, response), and others,^{11 12} we elected a simple handover documentation form containing all essential elements that was reviewed, signed and approved by PICU physicians to ensure better compliance to the process. Multiple educational sessions for the new handover document were performed at the beginning of each PICU rotating residents' block. These sessions made a major shift in the residents' behaviour towards better compliance with the process. Physicians' compliance data were collected evaluating handover documentation before and after all the interventions; however, no data could be collected during the improvement process due to lack of manpower and QI team members' involvement in their usual clinical duties. Mandating the developed form as an essential requirement in EMR before shifting patients from the PICU and

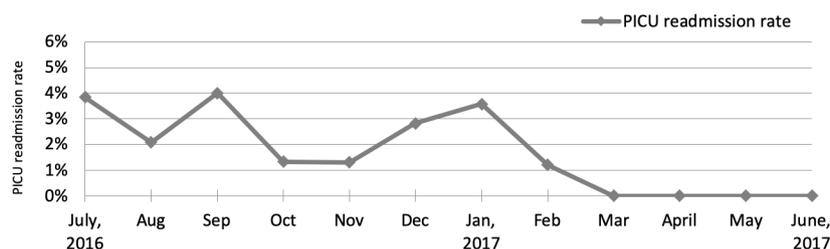
Table 1 Physicians satisfaction with the handover documentation form before (May 2016) and after (June 2017) the improvement interventions.

Characteristics	Pre interventions	Post interventions
Total responders	40	25
Gender		
Male	19 (47.5%)	12 (48%)
Female	21 (52.5%)	13 (52%)
Job title		
Consultant	12 (30%)	4 (16%)
Fellow	2 (5%)	0 (0.0%)
Resident	26 (65%)	21 (84%)
Specialty		
General paediatrics	30 (75%)	24 (96%)
Paediatric subspecialties	7 (17.5%)	0 (0.0%)
Paediatric surgery	3 (7.5%)	1 (4%)
There is clearly written handover document		
Disagree	15 (37.5%)	3 (12%)
Neutral	8 (20%)	5 (20%)
Agree	17 (42.5%)	17 (68%)
How would you rate the quality of communicated information?		
Good–excellent	19 (47.5%)	21 (84%)
Average	14 (35%)	2 (8%)
Poor	7 (17.5%)	2 (8%)
How much information did you receive to support proper care for transferred patients?		
Most of the info	24 (60%)	17 (68%)
About half of the info	8 (20%)	5 (20%)
Little info	8 (20%)	3 (12%)
How would you rate PICU patient's transfer process?		
Going well	12 (30%)	11 (44%)
Average	27 (67.5%)	14 (56%)
Unacceptable	1 (2.5%)	0 (0.0%)

PICU, paediatric intensive care unit.

empowering nurses to hold the transfer if the handover was not documented, enhanced the improvement effect and applied pressure on PICU primary physicians to complete the transfer handover document. Knowing that PICU patient transfer process involved several steps (eg, clinical evaluation and decision making, communication with the receiving team, bed allocation, and patient and family preparedness),¹³ we assumed that adding another

step of handover documentation to the EMR after a complicated course in the critical care unit would be an extra burden to PICU residents or fellows already loaded with heavy and stressful rotations. However, survey results highlighted an increased satisfaction with available documented information during the handover process. This is probably due to their awareness of the importance of such documentations summarising the PICU course

**Figure 3** Paediatric intensive care unit emergency readmission rate within 48 hours between July 2016 and June 2017. PICU, paediatric intensive care unit.

and providing critical information needed for managing transferred PICU patients. PICU emergency readmission rate can be attributed to several factors, such as patient's age, underlying condition, and PICU length of stay.¹⁴ Improving the patient transfer process including proper handoff might reduce PICU emergency readmission rate; however, evidence showing a reduction in ICU readmission rate is limited.¹⁵ Our PICU readmission rate declined to zero between March and June 2017 during the improvement phase, this reduction cannot be attributed to handover documentation standardisation alone but it warrants further research.

Lessons learned and limitation

Recently, recovered critically ill child with complicated diseases and PICU course needs high-quality handover process with clear and completely documented information. Regardless of the frame used for handover documentation form, the most important step in this process is identifying all information needed and passing them to the next team in a standardised and clear manner. During busy on-call times, it is challenging for receiving physicians to collect all information needed for the continuity of care when patients are transferred from the PICU. Therefore, standardised handover documentation can save time and help them continue managing patients effectively as planned with needed follow-ups. The lack of manpower and resources did not prevent the PICU team from implementing, educating and following up on the project as their time and energy allowed; this limited the team ability to collect data for the control phase and measure improvement sustainability. Second limitation was out-of-hours discharges from PICU to ward due to bed pressures; they are complicated by time constrain to empty a PICU bed, a smaller on-call team and transferring of patients who they might not know the details of their PICU course.

CONCLUSION

Implementation of standardised handover form is essential to improve physician compliance for clear handover documentation and to avoid data omission during the patient transfer process. Documented handover in patients EMR has a positive impact on physician satisfaction and confidence when managing post PICU discharge patients.

Acknowledgements The authors acknowledge all PICU staff, quality and patient safety team, and residency programme in KASCH hospital and King Saud Bin Abdulaziz University for Health Sciences for their hard work and commitment to patient safety.

Contributors HA: QI project team leader, manuscript writing. MA and AA: QI project team member, manuscript review and edit. OA: QI specialist, data analysis and methodology writer. KA-S: QI project mentor, methodology editor. YK: QI team member, manuscript review and edit.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available upon request.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Hamza Alali <http://orcid.org/0000-0002-3177-9147>

Yasser Kazzaz <http://orcid.org/0000-0003-3590-4547>

REFERENCES

- Maharani R, Thabrany H. How to improve patient handoff quality for ensuring patient safety: a systematic review. *KLS* 2018;4:292.
- Smaggus MD A, Weirnerman MD AS. Handover: the fragile lines of communication. *Can Journ Gen Int Med*;10.
- The Joint Commission. Sentin. alert event, issue 58; ina. hand-off Commun, 2017. Available: www.jointcommission.org
- Siemsen IMD, Madsen MD, Pedersen LF, et al. Factors that impact on the safety of patient handovers: an interview study. *Scand J Public Health* 2012;40:439–48.
- Horwitz LI, Moin T, Krumholz HM, et al. Consequences of inadequate sign-out for patient care. *Arch Intern Med* 2008;168:1755.
- Roberts JC, Johnston-Walker L, Parker K, et al. Improving communication of patient issues on transfer out of intensive care. *BMJ Open Qual* 2018;7:e000385.
- Williams TA, Leslie GD, Elliott N, et al. Introduction of discharge plan to reduce adverse events within 72 hours of discharge from the ICU. *J Nurs Care Qual* 2010;25:73–9.
- Edwards JD, Lucas AR, Stone PW, et al. Frequency, risk factors, and outcomes of early unplanned readmissions to PICUs. *Crit Care Med* 2013;41:2773–83.
- Coon EA, Kramer NM, Fabris RR, et al. Structured handoff checklists improve clinical measures in patients discharged from the neurointensive care unit. *Neurol Clin Pract* 2015;5:42–9.
- Alolayan A, Alkaiyat M, Ali Y, et al. Improving physician's hand over among oncology staff using standardized communication tool. *BMJ Qual Improv Rep* 2017;6:u211844.w6141.
- Riesenberg LA, Leitzsch J, Little BW. Systematic review of handoff mnemonics literature. *Am J Med Qual* 2009;24:196–204.
- Dingley C, Daugherty K, Derieg MK. *Improving patient safety through provider communication strategy enhancements*, 2008.
- Alali H, Kazzaz Y, Alshehri A, et al. Reducing unnecessary delays during the transfer of patients from the paediatric intensive care unit to the general ward: a quality improvement project. *BMJ Open Qual* 2019;8:e000695.
- Czaja AS, Hosokawa PW, Henderson WG. Unscheduled readmissions to the PICU: epidemiology, risk factors, and variation among centers. *Pediatr Crit Care Med* 2013;14:571–9.
- Storey J, Byrnes JW, Anderson J, et al. Utilizing a transfer of care bundle to reduce unplanned readmissions to the cardiac intensive care unit. *BMJ Qual Saf* 2018;27:66–72.

PICU patient transfer summary

PICU admission date/Time:	PICU discharge date/Time:
Attending intensivist:	Contacted receiving physician:
Source of PICU Admission:	
Reason for PICU admission:	
Problem list:	
Clinical assessment upon PICU admission:	
PICU course and investigations summary:	
Clinical assessment upon PICU discharge and code status:	
Consulted services:	
Plan of management and follow-up:	