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Handover from the emergency department to inpatient units: a quality improvement study.

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INTRODUCTION

Handover communication is linked to 25-40% of adverse events.[1] Clinicians' communication during handover is key to providing safe and high-quality patient care. Omission errors are attributed to 80% of handover discrepancies.[2] Thus, it is not surprising that improving clinical communication has been a patient safety goal for many years.

Handover is defined as the 'transfer of accountability and responsibility of patient care, from 1 professional or professional group to another'.[3] Handover is a complex procedure consisting of 2 major components: process, being the form and location of information transfer; and content, which is the overarching structure. Handover between 2 settings within the same facility can be complex because clinicians may have different expectations and priorities for content, and the logistical arrangements of transferring patients can create process issues.[4]

No 1 strategy has been shown as effective to improve intra-hospital handover,[5] however, standardisation strategies are advocated.[6] Standardised operating protocols (SOP) are a means for structuring handover content and process.[4] SOPs have been shown to decrease variability in communication and content errors, without increasing handover duration.[7] SOPs often include checklists such as SBAR (situation, background, assessment, recommendation)[6] to guide handover content and decrease the prevalence of handover related errors.[8]

Standardised patient safety solutions for handover require handover to be structured, documented, and monitored by end-users. Yet, these recommendations are not always translated into practice. In locally collected data we identified that intra-hospital handover between the Emergency Department (ED) and Inpatient Units (IPUs) contributed to adverse events and nurses expressed dissatisfaction with the process. The purpose of this quality

improvement project was to develop and test adherence to and nurses' perceptions of a SOP for nursing intra-hospital handover.

RATIONALE AND METHODS

The framework for co-production and prototyping was used to guide intervention development.[9] This framework has demonstrated utility and provides pragmatic step-by-step instructions for developing intervention content and delivery methods with diverse groups including researchers, policy makers, improvement leaders and clinicians through the integration of evidence-based literature with experiential knowledge. Involving frontline clinicians increases the likelihood of the intervention being context-specific, accepted and sustained.[10] Further, the framework provides direction for rapid prototyping prior to implementation.[9] We followed the SQUIRE 2.0 guidelines for reporting this manuscript.[11]

Context

This intervention was implemented in an 870-bed tertiary hospital, Australia. The ED, 3 medical IPUs, and 4 surgical IPUs participated. These units were selected because general medical and surgical patients were frequently admitted to these IPUs, from ED. Other highly complex units like intensive care were excluded as intra-hospital handover to these units required specialised content and process. The ED attended to over 170,000 ED patient presentations in 2017-2018.[12] A limited version of electronic medical records (EMR) was available at the hospital, which allowed clinicians to type progress notes. All other clinical documentation was paper-based and kept in a folder near the patient. Upon hospital discharge, these documents were manually scanned and uploaded into the EMR.

Intervention

A SOP for ED to IPU handover was developed, which included procedures for the handover process and a checklist for content. The SOP was developed as per the framework

for co-production and prototyping.[9] First, 'evidence review and stakeholder consultation' occurred, incorporating literature searches to identify evidence-based solutions, state-wide search for existing checklists and procedures used at other hospitals and elicitation of frontline ED and IPU nurses' views regarding issues and possible solutions for handover.[13]

Next 'co-production' took place, which involved monthly engagement with a team of front-line nurses, nursing unit managers, clinical nurse consultants, quality and safety staff. The whole team was representative of the participating units and communicated feedback to and from nursing colleagues on the units. During the 8-months of 'co-production', email communication was used to convey meeting discussions to those who were unable to attend. Iterative refinements were made to the SOP until final agreement was reached. For the checklist, stakeholders agreed on a SBAR format to promote a structured communication framework and included elements that were identified as either high risk, related to the national standards. The procedure for handover remained 3-stepped and emphasised that face-to-face, verbal communication must occur at least once, and patient/family participation in handover was an expectation. An overview of 3-step procedure pre- and post-intervention is provided in Supplemental Digital Content, Table 1.

Lastly 'prototyping' occurred, frontline and middle management nurses provided written and verbal feedback on the checklist which was used to revise the checklist. Some items like pressure injuries and falls risk assessment were retained in the checklist despite not being supported by participants because these items were related to risk assessment and were identified in national safety and quality healthcare standards.[14] The checklist was piloted during 15 handovers from ED to 1 IPU unit, over the course of 2 weeks (April 2017), and was deemed feasible and acceptable (Supplemental Digital Content, Figure 1). The SOP was formally reviewed and approved by the Directors of Nursing and the appropriate institutional committees.

A failure modes error analysis was undertaken to facilitate intervention implementation. 2 main failures were identified. The checklist might not be used by ED and IPU nurses and different implementation issues were identified across each IPU and the ED. Strategies included:

- Endorsing the checklist as official hospital documentation that must be uploaded in the electronic medical records
- ED nurse champions were engaged, and provided with work instructions and training materials, and took ownership for implementation in ED. 1 strategy included laminating the checklist and placing it in a visible position near the ED phones
- IPU educators on each unit were provided with work instructions and training materials and advised to implement the SOP in the best way for their unit
- Multiple communication strategies were used to promote the SOP including posters, email memos, and fact sheets

For 3 months post-implementation the SOP was monitored (May-August 2017), before becoming usual practice. The team audited EMR to assess checklist use and uploading practices and units provided feedback on an 'issues register'. After reviewing the issues register, no changes occurred to the SOP, however, frequent issues were fed back to ED champions and IPU educators.

Study of the intervention

The intervention was implemented on May 22nd 2017. Process and outcome measures were undertaken 4-months pre- and 6-months post-implementation. Process measures were observations, conducted by 2 nurses at the hospital, trained in study procedures. 1 nurse used a structured observation tool to ascertain content presented, and duration of handover (for Step 2, this included both transfers with and without a nurse pre-implementation). The other

nurse kept unstructured field notes, drawing diagrams of the location of participants, who participated in the handover, and the direction and frequency of communication and tools used.

For outcome measures, an adapted version of the widely used Handover Evaluation Scale survey was used to assess nurses' perceptions of the quality of handover. Sending nurses had 12 items and receiving nurses had 13 items, as per Spooner et al.'s[15] adapted version which has demonstrated validity and reliability. Nurses scored their responses on a 7-point Likert scale with responses ranging from strongly agree (1) to strongly disagree (7). Surveys were handed-out to nurses in-person by researchers, usually in the afternoon during nurses' education sessions.

Nurses of all qualifications and experience were invited to participate in observations and surveys if they regularly worked in the ED or IPUs participating in the study. Patients participated in observations if they were able to provide informed consent and were aged ≥ 18 years. Demographic data were collected from all participants.

Ethics

The hospital human research ethics committee provided ethics approval. All patients and nurses involved in observations provided informed signed consent. Return of survey implied nurse consent.

Analysis

Observational, survey and demographic data were entered into SPSS Statistics for Windows, Version 24.0, Armonk, NY: IBM Corp and 10% of data were checked for accuracy. Observational and demographic data were analysed descriptively including median and interquartile range and frequencies. For unstructured field notes, the frequency of communication and tools used was categorised into 3 levels (Supplemental Digital Content,

Table 2). These categories were consistent with previous handover research where infrequent/semi-frequent/frequent were categorised as thirds.[10]

Survey responses 'strongly disagree', 'disagree' and 'somewhat disagree' were collapsed into a broad category 'disagreement', and 'strongly agree', 'agree' and 'somewhat agree' were collapsed into the broader category 'agreement',[16] to allow comparison with previously published results from this scale. The neutral response point was retained. Survey data were analysed using frequencies.

RESULTS

Participants were similar pre- and post-intervention. Nurses who participated in observations and surveys were mostly female, Registered Nurses, aged 25-35 years, with up to 10 years' experience. A noticeable difference was pre-intervention 4 (28.6%) ED nurses observed worked as team leaders, while post-intervention 10 (55.6%) worked as team leaders. Patients observed were mostly male, with a median age of 53-56 years (IQR 36-43).

Process measures

15 ED to IPU handovers were observed pre-intervention and 16 post-intervention across the 7 IPUs participating. 13 IPU nurses and 17 ED nurses participated pre-intervention, and 14 IPU nurses and 18 ED nurses participated post-intervention. Step 1 of handover increased from a median duration of 3 minutes (IQR=1.5) before the intervention was implemented to 4 minutes (IQR=2.3) after intervention implementation. Most changes were seen in the rate of the information reported for assessment items; ED nurses more frequently discussed modifications to early warning score, interventions/investigation complete and presence of peripheral intravenous cannula and IPU nurses prompted more information about mobility status and diet. Overall, ED nurses' unprompted communication increased for many items across the SBAR framework such as electronic medical record

updated, patient care plan updated and notification of admission to patient/carer/next of kin. Importantly, allergy status was communicated more frequently, both unprompted and prompted.

Pre- and post-intervention, nurses remained at the nurses' station for Step 1, with patients' bedside chart and EMR used 'frequently' (Supplemental Digital Content, Figure 2). Post-intervention patient participation was more frequently observed, increasing to 'semi-frequent', with observers' field notes suggesting information required for handover needed to be obtained from the patient.

For Step 2, all patients were transferred with a nurse post-intervention. The median duration of transfers pre-intervention was 6 minutes (IQR=2), and 4.5 minutes post-implementation (IQR=3).

The median duration for Step 3 reduced from 4.5 minutes (IQR=1.8) to 2.5 minutes (IQR=1.8). Situation and background were often not stated pre- and post-intervention, except for provisional diagnosis and clinical history. Contrary to Step 1, we saw decreased information exchanged in Step 3, including early warning scores, diet and investigations/interventions to be complete. On the other hand, prompting increased for interventions/investigations complete.

Checklists were used for 11 handovers post-intervention; in 5 cases, the checklist was used to actively aid information-exchange at both steps 1 and 3, while in the remaining cases checklists were not actively used for Step 3, instead remaining at the nurses' station (Supplemental Digital Content, Figure 2). Handover conducted in the patient room, at the bedside increased to 'frequent' post-intervention. Patients' clinical documentation were used more often across all locations, with field notes suggesting more documentation checks were occurring. Further, family participation in bedside handover increased.

Outcomes (nurse perceptions)

For IPU nurses, the frequency at which participants agreed with 8 out of 15 survey items increased by more than 10% post-intervention, including being able to ask questions about information provided, found information provided in a timely fashion, easy to follow and current, and able to remain focused during handover (See Supplemental Digital Content, Table 3). For ED Nurses, the frequency at which participants agreed with the 2 out of 12 items survey items increased by more than 10% post-intervention, including sharing upcoming plans for patient care, and the environment for handover minimised distractions. 1 survey item decreased by more than 10% post-intervention which was the statement that current handover practice and/or documentation tools helped deliver a succinct handover. More ED nurses reported neutral responses to feeling comfortable delivering confidential and/or sensitive information at the bedside post-intervention.

DISCUSSION

Incremental changes in content and process were seen after the introduction of a SOP for intra-hospital handover. Consistent with previous research, the introduction of a checklist increased the rate of information-exchange, while decreasing the overall duration of handover.[7] There was a reduction in content in Step 3; nurses were focused on interventions that had been completed, suggesting Step 3 became a discussion about changes since Step 1 information-exchange. Similar to previous literature, we also observed that patients and family contributed information,[17] and nurses checked patient documentation[18] when bedside handovers occurred. However, researchers have shown that nurses' acceptance for and uptake of bedside handover can be slow,[19] which may be why some observed handovers did not occur at the bedside post-implementation in our study.

Our study demonstrated that the competing demands and values between ED nurses and IPU nurses may be a paradox. Paradoxes emerge when individuals juxtapose competing demands within the same space, their tensions are dual and in direct opposition of 1 another.[20] Post-implementation IPU nurses prompted more information, the most common questioning behaviour undertaken during handover.[21] In addition, they had better perceptions of the content received due to its currency, format, and timeliness, which is contrary to IPU nurses' well-documented frustrations with receiving ED handovers.[22] Thus, the SOP accommodated the tensions IPU nurses faced.

However, the resultant effect was ED nurses' needs were not fully met, as their perceptions of handover were unchanged or repelled in the opposite direction, representing opposing poles.[20] ED nurses thought 'documents and tools' made handover more onerous post-intervention, which could be attributed to IPU nurses' increased prompting, ED nurses transporting patients more often, or ED nurses providing more comprehensive information-exchange. Ultimately, the SOP created aimed to create uniformity in performance and communication; which lead to a detrimental cycle, where 1 party's needs were met, and the others were not.

To address this paradox, investigators could identify ED nurses' tensions in real-world conditions, and develop strategies to accommodate, but not eliminate, these.[20] Paradoxes never go away; thus, ongoing assessment and strategy development are required to accommodate them.[23] It may be important to provide feedback to ED nurses that, despite their perceptions, handover was more succinct post-implementation with the overall time of handover being decreased and information-exchange improved. Ultimately, this aligns with ED nurses' demands to discharge patients within set times thus valuing quick information exchange about short-term care information.[24-25] This knowledge may help accommodate the paradox.

Our project has limitations. Data collected encompassed whether an item on the checklist was stated, or not. In future studies, it would be important to assess the accuracy of the information, as well as the frequency. In the post-intervention observations, 2 patients were unable to be observed because they were unexpectedly transferred to procedures rather than IPUs, thus more handovers were observed post-intervention (n=16) than pre-intervention (n=15).

CONCLUSIONS

The SOP created and implemented remains in practice, and the checklist has been extended in use, for transfers between IPUs, and hospitals. However, enhancing intra-hospital handover is a challenge; nurses' priorities and needs can be paradoxical and influenced by workplace pressures. In our study, we may have sufficiently addressed IPU nurses' needs by enhancing the amount of comprehensive information received, albeit sometimes through increased questioning. However, ED nurses saw handover as more onerous; despite handover duration and unnecessary information being reduced. Ultimately, there is more work required to accommodate ED nurses' needs, however, when introducing efficiencies patient safety also needs to be maintained. Since our rigorous quality improvement project was undertaken, ongoing strategies have been trialled to meet nurses' demands, for instance, IPU nurses now travel to the ED in Step 2. Ultimately there is never an absolute resolution for paradoxes; partnerships between ED and IPU nurses are needed to achieve best practice outcomes, while meeting nurses' needs.

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