

Comparison of a Nurse-Nurse Handoff Mnemonic With Real-World Handoffs

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ABSTRACT

Background: Communication failures, including clinical handoff or clinical handover errors, contribute to 80% of all serious preventable adverse events each year. The N-PAS, N = Nurse, P = Patient Summary, A = Action Plan, and S = Synthesis, is a flexible standardized clinical handoff tool for nurses.

Purpose: The purpose of this study was to determine the proportion of N-PAS core components present in real-world patient handoffs.

Methods: A mixed-methods design was used to analyze secondary data. Patient handoffs ($n = 138$) were transcribed into statements and then independently coded by 2 research assistants.

Results: Of all handoff statements, 63.2% were coded as Patient Summary and 13.6% were coded as Action Plan, whereas Synthesis was not coded in any handoffs. Three new Patient Summary elements and 1 new Action Plan element were identified.

Conclusion: Patient Summary and Action Plan are critical data reported during clinical handoff. A handoff synthesis is a critical step to include in handoff training.

Keywords: clinical handoff, clinical handover, communication, handoff, mnemonic, nurse-nurse handoff

Clinical handoff (also called clinical handover) requires an exchange of patient information, responsibility, and control between providers at shift or service changes.¹ The immense volume of handoffs in health care, combined with the potential for communication failures and patient harm, makes handoffs an ideal target for improving patient outcomes. Handoff communication is the most frequent type of communication that occurs within the hospital environment, with an estimated 4000 occurring in a single teaching hospital in 1 day.² Communication failures, including clinical

handoff errors, contribute to upward of 80% of all serious preventable adverse events each year.³

The World Health Organization and other key stakeholders list handoff communication as a top international patient safety priority and have included the need for standardized and structured handoff approaches within clinical guidelines.⁴⁻⁶ The Joint Commission has recommended mechanisms for improving quality of handoffs including an organizational commitment to safety and quality, handoff training, and the use of handoff systems.² Also recommended is the need to include an evidence-based handoff tool to structure communication and to ensure that the minimum but critical content is communicated to the receiving nurse. Despite these recommendations, there is evidence that handoff communication errors have not significantly decreased.⁷

The development of institutional policies and strategies to improve handoff communication for direct care nurses are difficult because of the gap in knowledge about what is the critical knowledge to pass from nurse to nurse at shift change.^{8,9} To address this gap, a 2018 study sought to identify the core components of

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nurse-nurse handoff at shift change.¹⁰ They found that the core components of a nurse-nurse handoff include a Nurse (N) Patient Summary (P), Action Plan (A) and Synthesis (S). Termed the N-PAS tool, the authors identified the need to further evaluate the N-PAS in relationship to real-world nurse-nurse handoffs.

BACKGROUND

Standardized approaches to handoff, including mnemonics, provide a method for decreasing errors related to differing handoff communication styles.^{9,11,12} There are at least 27 handoff approaches, supported by mnemonics, to standardize verbal communication between clinicians.⁹ A 2016 content analysis study of 27 handoff mnemonics revealed that 12 primary pieces of information are common across all 27; however, the authors noted that none of the 27 mnemonics was comprehensive enough to cover all 12 themes, including SBAR (Situation, Background, Assessment, and Recommendation).⁹ SBAR is a standardized framework that was developed in the military for communication of urgent issues between members of different organizational ranks. Although the SBAR framework has been consistently applied, various handoff formats have evolved including nurse-physician tools, nurse-nurse shift change tools, and nurse-nurse unit transfer tools. A comprehensive review of the literature confirms that SBAR, along with most other handoff mnemonics, has not been validated as an effective shift change handoff method for nurses.^{9,13-15}

The I-PASS, a standardized handoff tool, with established validity for physician handoffs, provides the following framework: I = Illness Severity, P = Patient Summary, A = Action List, S = Situation Awareness and Contingency Planning, and S = Synthesis by Receiver. Hospitals that have implemented I-PASS have reported significant reductions in overall medical error rates (23%), preventable adverse events (30%), and near misses/nonharmful medical errors (21%).¹⁶⁻²⁰ A modified version of the I-PASS was evaluated as part of a nursing handoff bundle for a pediatric intensive care unit (ICU), and findings demonstrated a significant increase in verbal handoff completion with reduced interruptions.²¹ While these are important findings, the I-PASS modifications were done in the context of the usability for nurses in an ICU setting and did not include

reliability and validity testing of the tool for nursing.

To determine whether the I-PASS was a fit for nursing shift change handoff, an expert panel was convened, and using Delphi methods, the panel designed a nurse-centric tool. Information about the development of the N-PAS tool can be found elsewhere.¹⁰ The N-PAS is a flexible standardized nursing handoff approach designed to include the essential content to be handed off with an understanding that additional unit-based elements could be added depending on the context. The N-PAS provides a structured framework, where the “N” stands for the identifier Nursing.¹⁰ The P = Patient Summary and is defined as pertinent data to inform the provision of nursing care. It includes 15 areas important to a handoff including patient demographics, pertinent medical history, and medications. The A = Action Plan is the holistic view of the patient needs and includes recommendations for patient interventions to monitor. The last component of the N-PAS is “S,” the nurse-nurse Synthesis, which allows for an exchange of information between the sending and receiving nurses.

The purpose of this article was to validate the N-PAS tool against real-world nurse handoffs. The first aim was to determine the proportion of N-PAS core components and its associated elements present in real-world nurse-nurse handoffs at shift change. A second aim was to identify any nurse-nurse handoff content elements absent in the N-PAS using qualitative content analysis.

METHODS

Design, sample, and setting

A mixed-methods design was used to analyze data collected between February 2014 and April 2014 on inpatient nurse-nurse handoffs. Data collection occurred on a general medicine unit at a 495-bed major academic hospital in the Midwest United States.²² The hospital is located on an urban medical campus and in a typical year sees approximately 20 000 hospitalizations. The overall census on the general medicine unit ranges from 15 to 60 and typical patient diagnoses include asthma, congestive heart failure, diabetes mellitus, pneumonia, and other nonsurgical patients. The mean length of hospital stay was 5.7 days, and the nurse-to-patient ratio on the unit was 6:1.

Over the 3-month data collection period, 138 handoffs between an outgoing nurse and an

incoming nurse were collected at 7 AM, 3 PM, or 5 PM, depending on the nurse schedule. Handoffs were not unique to 138 nurse pairs, meaning they represent a sample of handoffs over that 3-month period of nurses on the unit. Nurses used a printed care plan utilizing an SBAR communication structure to hand off their patient. The handoff sheets were integrated into the hospital electronic health record (EHR).

Data collection

Nurse-nurse handoffs were audio-recorded, which were de-identified and transcribed professionally by a medical transcription agency. Transcripts were then segmented into functional units of conversation or statements. Supplemental Digital Content Table 1 (available at: <http://links.lww.com/JNCQ/A691>) provides examples of handoff statements that include phrases such as “he’s due for insulin” or “dressing change due at 5 PM.” Each statement was also coded for its speaker type (sending and receiving nurses). This process was informed by content and conversational analysis methods.²⁰ The study was approved by the university and hospital institutional review boards. Patients were exempt from being consented. Written consent was obtained from all nurses.

Coding dictionary

A series of steps were used to analyze the secondary data. First, a coding dictionary for the N-PAS was created. The dictionary was derived from common nursing and medical terminologies. The dictionary includes the code name, definition, the N-PAS component that the code belongs to, as well as at least 1 clarifying example to assist with future coding of the data. Additional codes were added inductively as they emerged to code for missing elements, not present in the N-PAS. These codes were termed, Pertinent Other, Not Pertinent Other, and Contextual. Pertinent Other was defined as a subcategory not identified previously.¹⁰ This code was used to identify new elements that had not yet been identified in the prior study. Not Pertinent Other were statements that did not contain enough information to code. Examples include “Sure” or “Yay.” Contextual were statements that provided information relevant to care but without direct clinical information. For example, the name of the medical team covering

the patient or the pager of the service covering the patient.

Pilot testing of the coding dictionary was conducted using a sample of 5 nurse-nurse handoffs. Three investigators independently coded the handoffs using the coding dictionary. All discrepancies were jointly discussed in relationship to the dictionary, and modifications were made to clarify certain codes. A second round of 20 handoffs was then analyzed by 2 independent researchers, with no additional modifications made to the coding dictionary.

Training on content coding

Two research assistants were trained to independently code all 138 nurse-nurse handoffs. Using an initial sample of 5 handoffs, research assistants coded all statements within each of the 5 handoffs using the coding dictionary. All discrepancies were jointly discussed with the research team, and comparisons were made back to the dictionary. Additional training of the research assistants was done using those sample cases. Interrater reliability, using Cohen’s kappa statistic, for the 5 initial handoffs was $\kappa = 0.736$. Additional training was done using the same process of training across 20 handoffs. The research assistants then independently coded all 138 handoffs with a final $\kappa = 0.936$.

Data analysis

To determine the proportion of the N-PAS core components found in real-world nurse-nurse handoff, quantitative descriptive statistics were used to compute the number and percentage of each element present across all handoffs. To identify elements missing from the N-PAS, qualitative content analysis of all handoff statements was coded as Pertinent Other.

RESULTS

A total of 4185 statements across the 138 nurse-nurse handoffs were analyzed. The range per each handoff was between 7 and 100. We first determined the proportion of N-PAS core components and their associated elements in real-world nurse-nurse handoffs. Sixty-three percent of all handoff statements were coded under Patient Summary, and 13.6% were coded under Action Plan. Synthesis by Receiver was not coded in any of the handoffs. Pertinent Other had a frequency of 10%. Both Not Pertinent Other and Contextual had frequencies of 6.6%.

Missing elements from the N-PAS were first identified. Using Pertinent Other to code these, 3 new elements were identified under Patient Summary and 1 new element was identified under Action Plan. Under Patient Summary, Intake/Output, Wounds/Dressing Changes, and Patient Psychosocial were identified as new pertinent handoff codes. “Consultations” was identified as a new element under Action Plan. Supplemental Digital Content Table 2 (available at: <http://links.lww.com/JNCQ/A692>) includes the revised N-PAS tool with the total percentage of all elements.

DISCUSSION

This study evaluated the N-PAS against real-world nurse handoffs. Two of the 3 N-PAS components, Patient Summary and Action Plan, were present in all the 138 handoffs. Like the I-PASS tool, Patient Summary and Action Plan appear to be critical data to report during nurse handoffs. However, there are many elements from the N-PAS, under Patient Summary and Action Plan, which were of low frequency, such as code status, allergies, pertinent family information, and precautions. It is possible that many of these elements are not necessary to include in every verbal handoff. For example, if the sending and receiving nurses are familiar with the patient, it may not be relevant to include a medical history every time the patient is handed off. Patient Summary data could also be directly extracted from the EHR. Tisdale et al²³ found that when the EHR was used as a supplemental tool with the I-PASS, that handoff completeness improved significantly.

The third component of the N-PAS, Synthesis by Receiver, was not coded in any of the nurse-nurse handoffs. Previous studies have shown that a handoff synthesis, asking questions and clarifying information to prioritize the plan for the day, is key to communication error reduction.^{24,25} The I-PASS model emphasizes 3 areas to focus on during the Synthesis by Receiver: asking questions, summarizing what was heard, and restating key actions to do. The lack of a nurse-nurse synthesis within this study is likely reflective of what the literature depicts as the error prone, fast-paced environment of real-world handoffs where a structured handoff is often replaced by a casual handoff that lacks critical information.³

The N-PAS provides a structured and organized, yet flexible, handoff tool for passing on

patient care data. Flexible standardization has been cited as crucial for assisting the incoming nurse with anticipating events and cuing in to identify information gaps.^{23,24} Theoretically, if nurses consistently utilize a shared evidence-based handoff structure, there is a greater chance for complex information to be effectively communicated and interpreted. A benefit of the N-PAS tool is that it can be tailored to the clinical setting and to the end-user needs, which are supported in the literature as critical for complete and accurate communication transfer.⁹

While the N-PAS is a promising handoff tool, the fit within actual nursing care and workflow is an area that needs further exploration. As part of future work, it will be important to examine the frequency of the N-PAS elements across a diverse sample of nurse-nurse handoffs, including units with bedside report and units that incorporate EHR cognitive aids into handoff. A project is currently underway to evaluate the feasibility of using the N-PAS on a 33-bed medical unit in Indiana. Simultaneously, work is ongoing to evaluate the development of a handoff curriculum for prelicensure nursing students at a Midwest nursing program, using virtual simulation as a tool to teach and evaluate handoffs. Prelicensure handoff training using best practice methods, including incorporating a synthesis between the sending and receiving nurses, is a fundamental first step toward changing the culture and practice of nurse-nurse handoff.

Limitations

The sample consisted of 1 purposively selected hospital unit, which is not representative of all types of nurse-nurse handoffs. Each of the 138 handoffs was not unique to 138 nurses, meaning the data may represent specific nurse handoff communication styles. A broader sample of communication styles might have been observed if the sample had been random or from a sample of 138 different nurses. However, the high-frequency match between the N-PAS and the nurse-nurse handoffs leads these researchers to believe that these limitations are minimal.

CONCLUSION

Despite consensus on the recommendation for handoff communication best practices, significant improvements in handoff communication and a reduction in handoff failures have not been demonstrated. The I-PASS Patient Safety

Institute provides a model from which to base our nurse-centric N-PAS curriculum that is standardized and modeled after an effective handoff between the sending and receiving nurses.

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