



## Characterizing the structure and content of nurse handoffs: A Sequential Conversational Analysis approach



Joanna Abraham<sup>a,\*</sup>, Thomas Kannampallil<sup>b</sup>, Corinne Brenner<sup>c</sup>, Karen D. Lopez<sup>d</sup>, Khalid F. Almoosa<sup>e</sup>, Bela Patel<sup>e</sup>, Vimla L. Patel<sup>c</sup>

<sup>a</sup> Department of Biomedical and Health Information Sciences, College of Applied Health Sciences, University of Illinois at Chicago, Chicago, IL, United States

<sup>b</sup> Department of Family Medicine, College of Medicine, University of Illinois at Chicago, Chicago, IL, United States

<sup>c</sup> Center for Cognitive Studies in Medicine and Public Health, The New York Academy of Medicine, 1216 5th Avenue, New York, NY, United States

<sup>d</sup> Department of Health Systems Science, College of Nursing, University of Illinois at Chicago, 845 S. Damen Avenue, Chicago, IL 60612, United States

<sup>e</sup> Department of Internal Medicine, Division of Critical Care Medicine, University of Texas Health Science Center, Houston, TX, United States

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### ABSTRACT

Effective communication during nurse handoffs is instrumental in ensuring safe and quality patient care. Much of the prior research on nurse handoffs has utilized retrospective methods such as interviews, surveys and questionnaires. While extremely useful, an in-depth understanding of the structure and content of conversations, and the inherent relationships within the content is paramount to designing effective nurse handoff interventions. In this paper, we present a methodological framework—*Sequential Conversational Analysis (SCA)*—a mixed-method approach that integrates qualitative conversational analysis with quantitative sequential pattern analysis. We describe the SCA approach and provide a detailed example as a proof of concept of its use for the analysis of nurse handoff communication in a medical intensive care unit. This novel approach allows us to characterize the conversational *structure*, clinical *content*, *disruptions* in the conversation, and the inherently *phasic* nature of nurse handoff communication. The characterization of communication patterns highlights the relationships underlying the verbal content of nurse handoffs with specific emphasis on: the interactive nature of conversation, relevance of role-based (incoming, outgoing) communication requirements, clinical content focus on critical patient-related events, and discussion of pending patient management tasks. We also discuss the applicability of the SCA approach as a method for providing in-depth understanding of the dynamics of communication in other settings and domains.

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### 1. Introduction

Patient handoffs involve the transfer of information, responsibility, and control between care providers and are viewed as an *ubiquitous*, *clinical* and *organizational* activity [1]: *ubiquitous* as they occur across various groups of clinicians; *clinical* as they serve as a forum for sharing patient-related information; and *organizational*, as they occur at all levels of a hospital. Nurse handoffs (also referred to as “shift reports”) are the most frequent [2], averaging approximately 2 million per year in a mid-size hospital [3,4]. Failures during handoffs contribute to nearly 35% of sentinel events and medical errors [5,6]. These failures arise from limited structure during communication [7], multiple communication approaches

[8], time constraints [9,10], interruptions and distractions [11,12], lack of training [13], and communication bottlenecks [14–18]. These failures have been associated with incorrect or delayed diagnosis and treatment, prolonged morbidity, increased patient length of stay, clinician and patient dissatisfaction, and increased costs [19–21].

To promote safer handoffs, The Joint Commission (TJC) spearheaded efforts [22–24] to standardize communication activity [15,25], leading to the development and implementation of new or re-designed handoff strategies and processes [26,27]. These efforts have also led to standardization initiatives and the development of handoff tools based on templates, spreadsheets, checklists and mnemonics [28,29]. While these solutions have been widely implemented, there is still a lack of consistency in their adoption and use [30]. It has generally been acknowledged that the standardization efforts should rely on understanding the content and structure of handoff communication [31]. Although TJC has

\* Corresponding author at: 1919 West Taylor Street, Chicago, IL 60612, United States. Tel.: +1 312 413 4623.

E-mail address: [abrahamj@uic.edu](mailto:abrahamj@uic.edu) (J. Abraham).

launched such efforts to *standardize the content of communication*, there is little agreement, as to “what” needs to be standardized and “how to” standardize—both in terms of clinical content, and structure [21].

Developing an informed understanding of the content and structure of handoff communication can have implications not only for minimizing communication errors in nursing practice, but also for developing evidence-based guidelines for handoff training, and the design of nurse handoff interventions. However, much of the prior research on handoffs, with some notable exceptions (e.g., [32]), are “descriptive” relying on retrospective evaluations, rather than developing a “deeper understanding of what they [handoffs] are, what needs they serve, and what actually happens in them” [33]. Part of the reason for such evaluations can be attributed to the lack of methodological approaches for: (a) tracing the evolution of handoff conversations, (b) investigating the inherent relationships within these conversations, and (c) identifying causes of disruptions during conversations. In this paper, we introduce a methodological framework, *Sequential Conversational Analysis* (SCA) that relies on a mixed-method approach that integrates a qualitative conversational analysis with a quantitative sequential pattern analysis for evaluating interactions during handoffs.

## 2. Methodological approaches for studying handoff communication

In this section, we first describe the prior research on nurse handoff communication, focusing on the evaluation techniques that have been previously used. Next, we describe the SCA approach and its applicability for analyzing communication.

### 2.1. Background: communication during nurse handoffs

Nurse shift report serves as an interactive forum for transfer of information regarding the patient, family and other contextual issues [34,35]. With the sheer volume and frequency of shift changes, ensuring safe, effective and efficient handoffs is challenging, but critical for maintaining care continuity across shifts [36]. Besides supporting patient care, researchers have emphasized that nurse handoffs provides social and psychological support for achieving nursing staff cohesiveness, professionalism, socialization and learning. Given the primary function of information transfer, nurse handoffs have been characterized as a “ritual” [37,38].

Studies of nurse handoffs have been conducted using several methods including interviews, case narrative reports, questionnaires and surveys (e.g., [39,40]). Using these methods, most research studies have highlighted perceived barriers for nurse handoffs including general communication problems, human factors issues, social and hierarchical problems, time and environmental constraints [22,41]. Evaluation studies of handoff tools using these methods have shown improvements in nurses’ perceptions of increased usefulness and efficiency, improved standardization of communication, improved information sharing skills, and most importantly, nurses’ confidence and satisfaction with communication [22,42]. For example, Nelson and Massey [42] conducted a *survey-based* study to investigate nurse satisfaction on the use of a handoff tool. They found that the handoff tool improved perceived usefulness and efficiency of the overall nurse workflow by reducing time spent on preparatory handoff communication activities. Similarly, Jukkala et al. [43] used surveys to report on nurse perceptions regarding a handoff tool based on the body-systems format. They found that standardization of content using the tool enhanced perceptions of communication effectiveness. Other survey-based studies (e.g., see [44]) showed perceived improvements in standardized communication and

workflow efficiency. Baldwin and McGinnis [22], using a questionnaire-based study, reported that 86% of their participants preferred the problem-based sign-out tool as it reduced chances of overtime, increased direct patient care time, and improved communication of patient data. Interviews have also been used for evaluating the nurse perceptions of the quality of handoff communication. For example, Roberts et al. [45] used interviews to illustrate the effectiveness of an SBAR (Situation, Background, Assessment and Recommendation) tool for handoffs. Interviews with nurses highlighted the importance of structured communication tools in facilitating collection and transfer of critical safety data that otherwise may have been lost.

As highlighted above, much of the prior research on nurse handoff communication, both with and without tools, has relied primarily on obtaining perspectives of the participant nurses using user-based surveys, questionnaires, and interviews [26,33]. While these studies are useful in characterizing the nature and perception of handoff quality, and care transition activities of nurses (e.g., [46]), they provide limited understanding of the dynamics of handoff conversations, especially with regards to the structure and content of communication.

Exceptions are studies by McCloughen et al. [2] and Carroll et al. [32] that have used complementary methods to understand the actual content of nurse communication. McCloughen et al. [2] used content analysis of nurse communication to explore the purpose, intent, practice, processes, and quality of handoffs in an inpatient mental health setting. They found that handoffs were retrospective, problem-focused, and inconsistent as they lacked structure and context. Similarly, Carroll et al. [32] investigated the nature of communication exchanges between nurses at shift change. Based on a multi-method study using audio recording of handoffs, interviews, surveys and review of patient records, they identified significant variations in the nature of communication based on role (incoming vs. outgoing nurses), and years of clinical experience. They also found that incoming nurses wanted an interactive conversation about the patient, while outgoing nurses wanted to present information without being interrupted. Similarly, experienced nurses provided shorter reports than less experienced ones, which led to significant number of follow-up questions, especially, by less experienced incoming nurses. While these studies highlight the importance of evaluating the content of clinical conversations, an in-depth understanding of the communication process and conversational strategies that are instrumental in designing appropriate handoff interventions is limited [2,22,47,48].

In the following section, we present a new methodological approach, Sequential Conversational Analysis, to evaluate the content, structure and nature of roles and relationships within handoff conversations. Such an approach also helps in examining the understated functions of handoffs such as social interactions, shared understanding, and distributed cognition [26,31,33,49,50].

### 2.2. Sequential Conversational Analysis

SCA is an exploratory mixed-method approach that combines in-depth qualitative analysis (using conversational analysis) with statistical temporal pattern analysis (using sequential analysis). SCA is based on the exploratory data analysis paradigm that relies on summarizing data through an open-ended approach, and does not rely on a priori hypotheses or statistical models [51–53]. Three inherent attributes of communication make SCA a viable and effective approach to study handoffs: (a) structural and semantic properties of communication; (b) inherent temporal properties of interactive communication; and finally, (c) breakdowns during the conversations, and its relationships with the structural and temporal characteristics.

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