Do deviations from ideal routines cause coordination errors? An exploration of coordination in an ambulatory care setting

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Abstract
Electronic Health Records (EHRs) are designed based on ideal-type routines that do not necessarily match how work occurs in practice. We conducted a multi-method study of routines and their participants in an interventional cardiology unit to more fully understand the impact of deviations from ideal-type routines. We found that the nature of the routine coupled with the strength and quality of relationships between its participants impact if deviations from the ideal lead to errors. This has important implications for designing information systems that support routines in practice.

Introduction
Preventing medical errors has been a long-standing problem in healthcare. One way to address interdisciplinary work is to develop routines that coordinate work between caregivers [1]. These routines, or repetitive patterns of action, have an ideal-type which does not necessarily match the actual performance of the routine in practice [2]. This is complicated by routines having aspects which are visible to others and others which are invisible, or hidden. Routines may also have different levels of complexity and variability. Because of these characteristics of routines, deviation from the ideal-type routines and the strength and quality of communication and relationships between the actors, has varying impact on errors. We sought to understand more about coordination routines including: how widespread deviations are; how often deviations lead to errors; how caregivers deal with the deviations and the relationship between deviations and errors. The results of this can be used to inform electronic health record (EHR) design.

Methods
The authors conducted a single-site multi-method case study in the interventional cardiology unit of a community hospital in the Midwest. We conducted interviews and document review to identify a set of ideal-type routines, which were validated with participants. Then, we conducted observations to compare the ideal-types to routines in practice. The Relational Coordination survey was administered as well [3]. Observational results were coded with NVIVO using a coding scheme devised from the literature to identify errors. Survey results were analyzed using SPSS. Then, correlations between differences and errors were calculated for the different routines.

Results
Differences between ideal-type routines and routines in practice were widespread. However, differences and errors were not necessarily correlated. It is not simply a difference from an ideal-type routine that leads to an error, but other factors such as variability in tasks, the visibility of coordination activities that support the routines and communication and relationships. Where there are strong communication and relationships as defined by a high relational coordination index, then deviations are less likely to lead to errors. This is because caregivers accommodate changes by identifying and addressing changes from the ideal. When this sharing does not occur, the ideal-type routine continues without accommodations, which often leads to errors.

Conclusion
A broader understanding of communication has important implications for systems design and development. Information systems can augment relational coordination and uncover invisible work by identifying changes from the ideal and making them known among participants. In addition, systems can help improve visibility of the supporting work for routines. Healthcare organizations can use this knowledge to design integrated routines and systems

References