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Healthcare

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Assessing the implementation of a bedside service handoff on an academic hospitalist service

Charlie M. Wray^{a,*}, Vineet M. Arora^b, Donald Hedeker^c, David O. Meltzer^{a,d,e}

^a Section of Hospital Medicine, University of Chicago Medical Center, United States

^b Section of General Internal Medicine, University of Chicago Medical Center, United States

^c Department of Public Health Sciences, University of Chicago Medical Center, United States

^d Department of Economics, University of Chicago, United States

^e Harris School of Public Policy, University of Chicago, United States

ARTICLE INFO

Keywords:

Handoff
Care fragmentation
Care transitions
Handoff implementation

ABSTRACT

Background: Inpatient service handoffs are a vulnerable transition during a patients' hospitalization. We hypothesized that performing the service handoff at the patients' bedside may be one mechanism to more efficiently transfer patient information between physicians, while further integrating the patient into their hospital care.

Methods: We performed a 6-month prospective study of performing a bedside handoff (BHO) at the service transition on a non-teaching hospitalist service. On a weekly basis, transitioning hospitalists co-rounded at patient's bedsides. Post-handoff surveys assessed for completeness of handoff, communication, missed information, and adverse events. A control group who performed the handoff via email, phone or face-to-face was also surveyed. Chi-square and item-response theory (IRT) analysis assessed for differences between BHO and control groups. Narrative responses were elicited to qualitatively describe the BHO.

Results: In total, 21/31 (67%) scheduled BHOs were performed. On average, 4 out of 6 eligible patients experienced a BHO, with a total of 90 patients experiencing a BHO. Of those asked to perform the BHO, 52% stated the service transition took 31–60 min compared to 24% in the control group. Controlling for the nesting of observations within physicians, IRT analysis found that BHO respondents had statistically significant greater odds of: reporting increased patient awareness of the service handoff, more certainty in the plan for each patient, less discovery of missed information, and less time needed to learn about the patient on the first day compared to control methods. Narrative responses described a more patient-centered handoff with improved communication that was time-consuming and often logistically difficult to implement.

Conclusions: Despite its time-intensive nature, performing the service handoff at the patient's bedside may lead to a more complete and efficient service transition.

1. Introduction

In order to provide around-the-clock coverage, shift- and block-based scheduling models (i.e. 7-days on, 7-days off) have become commonplace in many hospitalist programs. Subsequent to these scheduling models, patients often experience a “revolving door” of physicians due to the fragmentation that often accompanies their implementation. The increased number of handoffs that occur due to this fragmentation have been found to lead to increased costs, longer length of stay, and decreased patient satisfaction^{1,2}

Service transitions, when one physician hands off a panel of patients at the end of a service block to a new oncoming physician, are

especially susceptible to the adverse effects of discontinuity because they sever an established relationship between patient and doctor. While current guidelines primarily focus on shift handoffs, they do recognize that “service changes involve a more significant transfer of responsibility”.³ This is illustrated by a recent study that described significant associations between service transitions and mortality among hospitalized patients.⁴ Unfortunately, there is little guidance or research to support how to best conduct these transitions. Unsurprisingly, physicians commonly state that communication during inpatient transitions is often fraught with incomplete or missing information and lack a clear transfer of responsibility.^{5–8} Furthermore, it is well known that communication between hospitalists and their patients has clear

* Correspondence to: University of California San Francisco, San Francisco VA Medical Center, 4150S Clement Street, San Francisco, CA 94121, United States.
E-mail address: Charlie.Wray@ucsf.edu (C.M. Wray).

<http://dx.doi.org/10.1016/j.hjdsi.2017.06.002>

Received 7 September 2016; Received in revised form 9 May 2017; Accepted 17 June 2017
2213-0764/ Published by Elsevier Inc.

deficiencies, as many patients endorse not understanding their care plan, not receiving enough information about their hospitalization, and being unaware that service transitions have occurred.^{9,10}

By looking to other disciplines for guidance, we can begin to explore alternative methods to improve inpatient service transitions for both the patient and the physician. For instance, nurses have been performing their handoffs at the patient's bedside for years with evidence to suggest that this patient-centered approach has led to enhanced communication, improved patient safety and satisfaction, and decreased costs.^{11–13} Despite these benefits, we are unaware of any study that has explored the effects of implementing a bedside handoff (BHO) at a hospitalist service transition. Thus, we hypothesize that performing a BHO may be an effective mechanism to transfer patient information at this transition. The goals of this exploratory study were to assess the efficacy of a BHO from a physicians' standpoint and the effectiveness of implementing the intervention in an academic hospitalist service.

2. Methods

2.1. Implementation

We performed a 6-month, single-center, prospective intervention on a non-teaching hospitalist service to assess the efficacy and effectiveness of implementing service handoffs at the patient's bedside. Fifteen, core clinical faculty from the Section of Hospital Medicine participated in the study. These physicians cover three hospitalist day services, which consists of both general medicine and sub-specialty patients. All services utilize Nurse Practitioners or Physician Assistants (NPs) who co-manage half of the patients with the physician. Hospitalists rotate for 7 days at a time and typically care for 10–16 patients per day. Usual methods of service handoff are performed at the discretion of the two hospitalists the day prior to service changeover and consist of a conversation by phone or in-person without the patient being present, or a written sign-out typically sent by email, as previously described.¹⁴

In our intervention, two physicians participated in each BHO; an oncoming physician, which refers to the hospitalist who is taking over the service, and an outgoing physician, who signs-out care to the oncoming physician. In order to accommodate having both physicians in the hospital on the same day, all oncoming physicians were scheduled a previously existing Bridge shift, whose only responsibility is to admit patients from the Emergency Department during the afternoon and early evening, on the day prior to officially starting on service (i.e. a service change). This allowed the handoff to occur in-person without having either provider bear the cost of coming into the hospital for an extra shift. Prior to this intervention, physicians were not routinely scheduled a Bridge shift prior to starting on service. If clinical care did not allow for adequate time to perform the BHO handoff, the physicians could opt out on that occasion and perform the service handoff under usual methods. The BHO was only performed on patients whom the outgoing physician was seeing alone (i.e., without NPA support), which averaged about half of the patients on the service. On a pre-defined, rotating basis, each of the services was scheduled to perform a BHO, while the alternate services acted as the control groups and were instructed to perform their service handoff in the usual manner. Hospitalist were advised to use the following format during the BHO discussion with the patient: Introduce the oncoming hospitalist to the patient, discuss the hospital course, care plan, and future tests and procedures, and give the patient the opportunity to ask questions and familiarize themselves with the oncoming physician.¹⁵ Prior to implementation of the intervention, all hospitalists were consented for participation, shown a video tutorial and emailed a guide on how to provide a BHO. Given that physicians participated in both the intervention and control groups, each "group" refers to physicians' observations when allocated to either the intervention or control group, and not to a specific set of subjects. All physicians participated in both the intervention and control groups, and no physician opted out of the

study. The University of Chicago IRB approved this protocol.

2.2. Data acquisition

From July to December 2015, each oncoming hospitalist was hand-delivered a 17-item survey 48 h after performing the service handoff. The survey was created to evaluate characteristics that were thought to differ between BHO and usual care (Appendix).^{14,16,17} Descriptive characteristics of the hospitalist and the service handoff were elicited. Eight domains meant to assess the clinical efficiency of the service handoff were explored: 1) completeness of information exchange between the two physicians, 2) certainty of care plan on the first day of service, 3) average time learning about a patient on first day, 4) missed information during the service exchange, 5) estimated time spent, per patient, due to missing information 6) adverse events (AE) or near misses due to missing or unclear information, 7) additional discussions with preceding physician after the original discussion, and 8) number of sources used to recover missing information. Additionally, physicians were asked about patient and family awareness of the service transition, as perceived by the physician. They were also asked to provide estimates of how long it took to perform the service handoff when a BHO was included. We elicited narrative feedback about specific aspects of the BHO that were considered either valuable or not helpful and whether physicians would continue if the BHO were not a part of a research study.

2.3. Data & statistical analysis

Due to the skewed nature of the survey results, the 5-point Likert responses for completeness of handoff were categorized so that "complete handoffs" were defined as responses of "somewhat complete", and "complete", while "incomplete handoffs" were defined as responses that included "grossly incomplete", "incomplete", and "somewhat incomplete". Similarly, certainty of plan on first day of rotation was categorized so that "certain" was defined as responses of "somewhat certain", and "mostly certain", while "uncertain" was defined by responses that included "uncertain", "mostly uncertain", and "somewhat uncertain". Questions regarding discovery of missed information, adverse events due to missing information, and additional discussion with outgoing physician were dichotomized into "yes/don't know" and "no" responses. Conversely, patient and family awareness were dichotomized into "yes" and "no/unsure". Time was dichotomized into < 30, and > 30 min. Pearson chi-square analysis was used to assess for any differences between survey responses between those who performed the BHO and control groups, and those who were scheduled to perform, but were unable to do so and control groups. Of note, because physicians crossed over between groups, and the p-values in chi-square analysis assume independence of each observation, subsequent between-group differences are tested in the Item Response Theory analysis.

In order to take the nesting of observations within subjects into account, we utilized an item response theory (IRT) analysis to determine which items of the post-handoff questionnaire were associated with a positive endorsement of the BHO.¹⁸ Specifically, we used a Rasch model in which items were considered nested within subjects. As shown in Hedeker et al., this is essentially a (2-level) mixed effects logistic regression model that includes a random effect for the subject, item indicator variables as covariates, in addition to the effect of the type of handoff performed. To determine the appropriateness of the 2-level model, a model that did not include a random intercept was compared to this model. All analyses were performed using Stata version 14.0 (StataCorp, College Station, TX).

3. Results

Fifteen different hospitalists with an average of 1.8 (± 1.7) years of

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