Development of a Structured Year-End Sign-Out Program in an Outpatient Continuity Practice

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BACKGROUND: In an effort to prevent medical errors, it has been recommended that all healthcare organizations implement a standardized approach to communicating patient information during transitions of care between providers. Most research on these transitions has been conducted in the inpatient setting, with relatively few studies conducted in the outpatient setting.

OBJECTIVES: To develop a structured transfer of care program in an academic outpatient continuity practice and evaluate whether this program improved patient safety as measured by the documented completion of patient care tasks at 3 months post-transition.

DESIGN: Graduating residents and the corresponding incoming interns inheriting their continuity patient panels were randomized to the pilot structured transfer group or the standard transfer group. The structured transfer group residents were asked to complete written and verbal sign-outs with their interns; the standard transfer group residents continued the current standard of care.

PARTICIPANTS: Thirty-two resident-intern pairs in an academic internal medicine residency program in New York City.

MAIN MEASURES: Three months after the transition, study investigators evaluated whether patient care tasks assigned by the graduating residents had been successfully completed by the interns in both groups. In addition, follow-up appointments, continuity of care and house officer satisfaction with the sign-out process were evaluated.

KEY RESULTS: Among patients seen during the first 3 months, the clinical care tasks were more likely to be completed by interns in the structured group (73 %, $n=49$) versus the standard group (46 %, $n=28$) (adjusted OR 3.21; 95 % CI 1.55–6.62; $p=0.002$). This was further enhanced if the intern who saw the patient was also the assigned primary care provider (adjusted OR 4.26; 95 % CI 1.7–10.63; $p=0.002$).

CONCLUSIONS: A structured outpatient sign-out improved the odds of follow-up of important clinical care

tasks after the year-end resident clinic transition. Further efforts should be made to improve residents' competency with regard to sign-outs in the ambulatory setting.

KEY WORDS: patient safety; transfer of care; handoff; sign-out; continuity of care.

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INTRODUCTION

Transitions of care occur in various stages of inpatient and outpatient medical practice. The complexities of these transitions make such periods highly susceptible to medical errors. Effective communication between caregivers has been identified as a key component in reducing medical errors during transitions of care. According to the Joint Commission, communication failures were the root cause of 65 % of reported sentinel events in 2006 and a major cause of preventable medical errors.¹ As a result, the Joint Commission has recommended that all healthcare organizations establish a “standardized approach to handoff communication.”² Formalizing this process is not only important to the improvement of patient safety, but also enhance resident education and improves satisfaction in the doctor-patient relationship.^{3–9}

Most recently, researchers have begun to study the impact of year-end handoffs on patient safety in resident ambulatory care practices. Young et al.,⁷ in a multifaceted intervention in a psychiatric outpatient practice, demonstrated that the categorical designation of patients as ‘acute’ or ‘not acute’ by outgoing clinicians effectively identified patients at higher risk for hospitalization during transitions. This intervention over the span of 3 years resulted in substantial improvements in the proportion of acute patients seen within 30 days and the median time to the first visit after the transition. While encouraging, there is still a paucity of literature about resident year-end clinic handoffs, which is estimated to effect up to 1.92 million patients annually.¹⁰ Thus we chose to address this topic by: (1)

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developing a structured transfer of care program among trainees in an academic outpatient internal medicine continuity practice; (2) evaluating the impact on patient safety as measured by the documented completion of specific patient care tasks signed out by graduating residents to the interns inheriting their patient panels; and (3) evaluating trainees' perceptions about the piloted program. We hypothesized that a structured program would increase task completion by the interns who received sign-out compared to those interns who did not receive sign-out.

METHODS

Setting

The intervention took place in two of the three ambulatory care practices at an academic medical center in New York City. The third site, which already had a year-end sign-out process, was excluded. The combined practices comprised 113 residents and 32 general medicine faculty that service about 65,000 visits annually. The average resident patient continuity panel size was 98 patients (range 57 to 160).

At the end of each academic year, the graduating residents' continuity panels are re-assigned to the incoming interns based on site preference, education track, language fluency and gender. Before the re-assignment, residents are asked to identify medically complex patients who may be better suited for transfer to a more experienced resident rather than the incoming intern.

Prior to this study, the standard practice was for incoming interns to review the last office visit note in the electronic medical record at the time of the first patient care visit. There was no structured process in place for a written or face-to-face sign-out from residents to interns. Thus there are no data to estimate the percentage of residents who conducted sign-outs prior to this study.

Transfer of Care Structure and Process

The program was piloted at the end of the 2009–2010 academic year. Graduating residents with an established continuity panel were eligible for participation (Fig. 1). Residents were excluded if they ended the academic year on vacation, an abroad rotation, or were a study investigator. All eligible graduating residents and their corresponding interns were verbally consented for participation. Thirty-two resident-intern pairs (64 house officers total) were randomized using a random number generator.

Two structured transfer forms were developed by the study coordinators based on a review of the medical literature.^{3,11–15} The first form, called the Ten Tasks List (see [Appendix available online](#)), was a checklist of ten individual outstanding patient care tasks to be addressed by

the intern within the first 3 months of the academic year. Patient care tasks were limited to the following five categories: (1) laboratory, (2) radiology, (3) medication, (4) specialist consultation, and (5) advance directives. The tasks could involve follow-up on tests already ordered or instructions for tests to be ordered at future visits. Residents were also directed to reference these tasks in the last office visit note. The number of tasks was limited to ten solely for study purposes as this would yield approximately 320 charts that would require manual chart review in the allotted study period.

The second form, called the Sign-Out Document (see [Appendix available online](#)), was a list of patients in the continuity panel that the resident felt should be signed out. The number of patients included was determined by the resident, and the document asked residents to designate high-priority patients. High-priority patients were defined as those medically complex patients who required a follow-up appointment within the first 3 months of the new academic year.

These two distinct transfer tools were created to compare a more targeted, task-based sign-out (similar to that used in the inpatient setting) to a more comprehensive, free-form sign-out. Study coordinators provided instruction and guidance on the completion of the two forms during the consenting process.

Structured Transfer Group

Residents in this group were provided with a list of their continuity patient panel, asked to create a Ten Tasks List and a Sign-Out Document, and encouraged to verbally sign out both forms to the intern inheriting the panel. We allowed residents to decide how and when to conduct the sign-out. We did not facilitate or schedule time to conduct a face-to-face sign-out.

Copies of the forms were also given to the study coordinators. Study coordinators requested that study participants not discuss study details with each other. Interns were asked to use their first outpatient administrative session to contact and schedule appointments with high-priority patients identified on the Sign-Out Document. This phone call was not scripted, and documentation of the call was per the current standard in the electronic medical record.

Standard Transfer Group

Residents in this group were instructed to create a Ten Tasks List only. The Ten Tasks List was given to the study coordinator. The standard transfer residents were neither explicitly told to communicate nor discouraged from communicating this sign-out information directly to the

Figure 1. Enrollment, randomization and follow-up of residents.

incoming interns. The study investigators felt ethically that all interns should receive this document, and thus after the 3-month study period the standard transfer interns were given a copy of their respective Ten Tasks Lists from the study coordinators.

Outcomes

The primary outcome evaluated in this study was the number of patient care tasks completed from the Ten Tasks Lists 3 months into the new academic year. This was assessed through a retrospective chart review. In addition to this outcome, we also evaluated the effect of continuity [patient seen by the assigned primary care provider (PCP) during the index office visit] on the odds of task completion and the rates of follow-up for high-priority patients.

Surveys

A three-part survey was developed to evaluate the effectiveness of the sign-out process. The survey was electronically administered to all graduating residents 2 weeks after graduation and to all interns 3 months into the academic year. The first part of the survey was designed to assess the sign-out process; residents were queried about the approximate size of their panels, completion time for the documents, barriers to completion and perceptions about their usefulness. The second section

was designed to assess perceptions about sign-outs and their relationship to patient safety. Lastly, participants were asked an open-ended question to obtain detailed feedback about the sign-out process (see [Appendix available online](#)).

Data Analysis

Descriptive and bivariate analyses were performed using SPSS version 19 (SPSS Inc., Chicago, IL). The two-sample t-test and chi-square test were used to compare continuous and categorical variables, respectively, between the standard and structured groups. Univariate logistic regression was used to examine the relationship between sign-out intervention (standard versus structured) and task completion (yes/no), stratified by type of physician seen (PCP versus non-PCP, any MD visit versus no MD visit). Odds ratios and 95 % confidence intervals were calculated from the logistic regression models. Generalized estimating equation (GEE) modeling (for a binary outcome) was further performed to correct the 95 % confidence intervals for the odds ratios and their associated *p*-values for potential clustering of the clinical care tasks by resident/intern pair (STATA version 12; Stata-Corp, College Station, TX). All *p*-values are two-sided with statistical significance evaluated at the 0.05 alpha level. This study was approved by the Weill Cornell Medical College Institutional Review Board.

RESULTS

The study groups did not differ with regard to their basic demographics, educational track (categorical, primary care, research) or continuity panel size. While 32 residents were originally randomized, two residents (one in each randomization group) were excluded from the final analysis because their patient panels were divided between several interns (Fig. 1).

In total 25 Ten Tasks Lists were returned to the study coordinators: 12 (80 %) from the structured transfer group and 13 (87 %) from the standard transfer group. The rates of patient office visits (with any MD or PCP) during the study period were similar between the two groups (Table 1). Among the structured transfer group nine (60 %) residents created the Sign-Out Document. These documents referenced a total of 369 patients and a mean of 41 patients (range 18–75) per document. Residents identified a total of 73 high-priority patients and a mean of 9 (range 5–14) per document, of which 43 (72%) were also patients included on the residents' respective Ten Tasks Lists. Overall, 36 % of the high-priority patients were seen by a provider within the first 3 months of the academic year.

The overall number of clinical tasks completed by the two groups did not differ: 52 % by the structured transfer group compared to 41 % by the standard transfer group (adjusted model OR 1.55; 95 % CI 0.95, 2.50; $p=0.077$) (Table 2). In addition there was no difference in the rates of task completion between the five task categories (laboratory,

radiology, medications, specialists and advance directives). Among patients seen during the first 3 months, the clinical care tasks were more likely to be completed by interns in the structured group (73 %, $n=49$) versus the standard group (46 %, $n=28$) (adjusted OR 3.21; 95 % CI 1.55, 6.62; $p=0.002$). The odds of completing the clinical care task was further increased if the intern was the assigned PCP (adjusted OR 4.26; 95 % CI 1.7, 10.63; $p=0.002$) (Table 2).

Surveys

A total of 23 resident and 29 intern surveys were completed (81 % response rate). Only one intern in the standard group reported receiving sign-out; the format was a verbal sign-out done over the phone. Fifty percent of the residents in the structured transfer group reported that it took 2 h or less to develop the written handoff documents compared to 80 % in the standard group. Sixty percent of the structured transfer residents also verbally signed out with 50 % of the sign-outs taking less than 1 h.

More than half of residents (Table 3) and interns (Table 4) agreed or strongly agreed that sign-outs are important to patient safety and that a standardized sign-out process would be useful in the outpatient practice. Analysis of the responses by randomization group did not show any significant differences. The open-ended feedback from residents yielded a general consensus that the targeted format of the Ten Tasks List was more useful than the comprehensive Sign-Out Document. One resident reported being unable to complete any form of sign-out because of ending residency on a busy inpatient rotation (intensive care unit).

Table 1. Summary of Ten Tasks List and Sign-Out Document Creation and Follow-Up

	Structured Transfer ($n=12$ pairs)	Standard Transfer ($n=13$ pairs)	p value
No. tasks designated (10 per panel)	120	130	N/A
Mean no. tasks completed per intern (range)	5.17 (3–7)	4.08 (1–7)	0.10
No. patients seen in office visit by any provider (%)	61 (51 %)	61 (47 %)	0.32
No. patients seen in office by new PCP (%)	52 (43 %)	49 (38 %)	0.31
No. completed Sign-Out Documents (SODs)	9	N/A	N/A
No. patients on all SODs	369	N/A	N/A
No. "high-priority" patients	73 (20 %)	N/A	N/A
No. "high-priority" patients seen by any provider	26 (36 %)	N/A	N/A
Mean no. of patients per SOD (range)	41 (18–75)	N/A	N/A
Mean no. of "high-priority" patients per SOD (range)	9 (5–14)	N/A	N/A

DISCUSSION

The primary objective of this study was to evaluate whether a standardized outpatient sign-out process would result in improved measurable patient outcomes. The odds of completing the clinical care tasks were higher among interns who received sign-out and were also the PCP at the index visit. Overall, less than half of patients on the Ten Task Lists or high-priority patients were seen by their PCP during the first 3 months of the new academic year. This raises several key factors to address in the development of a comprehensive transfer process.

First, patients should be educated about their own outstanding medical issues and the need for follow-up. Recent studies have demonstrated the challenge of ensuring patient follow-up when resident physicians graduate. One study demonstrated that only 48 % of high-priority patients returned for follow-up care within a year of their former residents' graduation. Post-study

Table 2. Logistic Regression Model Estimating Odds Ratio for Clinical Task Completion

	Structured (n=12 pairs)	Standard (n=13 pairs)	Odds ratio (95 % confidence interval)		p value*
			Unadjusted	Adjusted *	
No. tasks completed (%)	62 (52 %)	53 (41 %)	1.55 (0.95–2.52)	1.55(0.95–2.50)	0.077
No. tasks completed for patients seen by any provider (%)	49 (73 %)	28 (46 %)	3.21 (1.53–6.72)	3.21 (1.55–6.62)	0.002
No. tasks completed for patients seen by PCP (%)	47 (84 %)	27 (55 %)	4.26 (1.72–10.56)	4.26 (1.70–10.63)	0.002

*Adjusted for clustering by resident pair

phone interviews revealed that many patients lacked an understanding as to why they needed to follow-up with a physician.¹⁶ Similar findings were seen in recent work by Pincavage et al.¹⁷ While the multifaceted transfer intervention of psychiatry patients developed by Young et al. resulted in greater rates of acute patients being seen within 30 days, the intervention did not decrease the proportion of patients lost to follow-up.⁷ The increased stress and confusion that patients may experience when their care is being transferred to new physicians amplifies their risk and makes effective follow-up imperative. The development of mechanisms to identify high-risk patients earlier, to provide priority scheduling, and to educate patients and residents about the need for close monitoring may reduce this lost-to-follow-up phenomenon.

Second, discontinuity may adversely affect the sense of ownership that physician trainees have for newly transferred patients, thereby posing a threat to trainee professionalism.¹⁸ Studies have found that discontinuity of care in the inpatient setting can result in increased hospital complications, longer lengths of stay and more medication errors.^{19–21} In addition, research has shown that the number of potentially preventable adverse events increased when patients were “cross-covered” by physicians not on the patient’s primary team.²² Our findings demonstrate that a higher percentage of tasks were completed when patients saw their assigned PCP, which highlights the importance continuity of care. While the primary focus of sign-outs is on the communication of critical clinical information from one provider to the next, there is also an official transfer of professional responsibility. The question of when the relationship with and responsibility

Table 3. Outgoing Residents’ Perceptions About the Sign-Out Process (N=23)

Sign-out process statement	Disagree or strongly disagree, %	Neutral, %	Agree or strongly agree, %
Sign-outs are an important part of maintaining patient safety	0	4	96
The sign-out process was taught well in my medical school	26	35	39
The sign-out process was taught well in my residency program	5	23	72
A sign-out process in the outpatient setting is as important as a sign-out process in the hospital	17	26	57
A standardized sign-out process would be useful to the outpatient program and to the patients	9	21	70
I am confident that the majority of my ten tasks will be completed by the incoming intern within the first 3 months of internship	17	30	53

Table 4. Interns’ Perceptions About the Sign-Out Process (N=29)

Sign-out process statement	Disagree or strongly disagree, %	Neutral, %	Agree or strongly agree, %
Sign-outs are an important part of maintaining patient safety	0	7	93
The sign-out process was taught well in my medical school	41	28	31
The sign-out process was taught well in my residency program	7	14	79
A sign-out process in the outpatient setting is as important as a sign-out process in the hospital	34	35	31
A standardized sign-out process would be useful to the outpatient program and to the patients	14	21	65
Overall I feel that I know my outpatient panel well	66	24	10
Overall I feel overwhelmed in the ambulatory setting	24	24	52

for a patient begins in the outpatient setting is one fraught with uncertainty. This issue is further supported in recent work where almost half (47 %) of residents reported they do not take ownership of a patient until the first clinic visit and 74 % do not feel comfortable completing paperwork for a patient they have not met.¹⁷ In the absence of a standardized sign-out, a doctor may be officially assigned as PCP but have no knowledge of outstanding clinical issues within the panel. This suggests the need for future emphasis on professionalism—in particular the role of shared responsibility among residents in academic ambulatory care practices.

Third, a template must be practical to facilitate the transfer process. Our study suggests that maintaining a focused ‘to-do’ approach in the outpatient setting helps limit the residents’ time commitment and may improve the likelihood of sign-out completion. We found that the completion of the Sign-Out Document was highly variable between residents with regard to the number of patients listed and the designation of high-priority patients. Due to the comprehensive nature of this document, residents routinely spent over 2 h on its completion, and 40 % of the residents in the structured transfer group did not complete it at all. While it is possible that the high non-completion rate may be due a sense of redundancy since residents were also asked to create a Ten Tasks List concurrently, we acknowledge that the Sign-Out Document may have been too overwhelming in time and scope to complete. Conversely, 80 % of the residents completed the Ten Tasks List, and most spent under 1 h creating it. Residents identified an average of nine high-priority patients with significant overlap between the Ten Task List and the high-priority patients. A written and face-to-face sign-out process that provides targeted handoff of relevant clinical and social information on high-priority patients is a strategy that is supported by other colleagues in this area.^{7,9,16}

Our study had several limitations. First, given the small sample size we could not detect larger changes because of statistical power. Second, as this was not a blinded study there are valid concerns for contamination of the intervention. Our attempt to measure the level of contamination by surveying residents on the transfer process is encouraging; based on survey results, only one intern in the standard transfer group received sign-out. While a minimal contamination can significantly impact the results in a small randomized control trial such as this, we believe our results are valid. Third, the utilization of completed clinical tasks is solely a surrogate for actual patient safety outcomes, and given the short time period over which this pilot was conducted, longer term conclusions regarding patient care cannot be made. There was no long-term review to assess adverse events (e.g., hospitalizations) that may have occurred as a result of tasks not being completed within the initial 3-month

period. Whether actual patient safety and health outcomes would improve with a formal outpatient transfer of care process remains to be studied. Lastly, due to limited resources we were unable to compare rates and times to first follow-up among high-priority and non-high-priority patients. This would have provided useful information regarding the effectiveness of providers using their first administrative session to contact high-priority patients, establish the new provider relationship and schedule a follow-up appointment. Previous studies demonstrate that graduating providers personally informing patients about their upcoming departure is the single strongest predictor of patient satisfaction.⁶ Thus, we believe that a provider’s direct communication with a patient during the transition period will be a key factor in establishing a mutually satisfying doctor-patient relationship.

To our knowledge, our study is the first randomized investigation of a structured transfer of care program in an academic internal medicine outpatient care practice. Our findings further support key features identified in pertinent landmark medical literature regarding enhancement of patient safety and resident training.⁹ We are currently in the process of completing a national survey of internal medicine residency programs throughout the US in order to better describe the current practices of outpatient transitions. We anticipate that future papers will expand on this key area of patient safety and residency training.

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