

An Intervention to Improve Ambulatory Care Handoffs at the End of Residency

MICHAEL J. DONNELLY, MD
JANELLE M. CLAUSER, MD
NEIL J. WEISSMAN, MD

Abstract

Introduction The medical literature shows evidence of numerous initiatives to improve inpatient physician handoffs. In contrast, handoffs of ambulatory patients to incoming interns or junior residents at the end of residency are an area of potential concern that has been overlooked.

Objectives To examine handoffs of high-risk ambulatory patients by outgoing residents to junior colleagues and to compare current practice to a standard handoff process. We hypothesized the intervention would lead to increases in the number and quality of ambulatory care handoffs.

Methods Fourteen graduating internal medicine and combined internal medicine-pediatrics residents who practiced at an academic continuity clinic were randomized to an intervention or a control group. E-mail instructions were sent asking the intervention group to write a handoff note using the clinic's electronic medical record system. The e-mail included a detailed outline of

information to incorporate and highlight features of the electronic medical record that would facilitate the process. The handoff notes of the intervention and control group were independently evaluated and scored for quality using a predetermined point system.

Results Six of the 7 residents (86%) in the intervention group completed 19 handoff notes; none of the residents in the control group completed handoff notes. Most of the handoffs provided a brief paragraph or 2 of background information on the patient and then focused on issues needing short-term follow-up during the coming months.

Conclusions The standardized handoff process implemented via simple e-mail instructions increased the number of outpatient handoffs at the completion of residency. Further study with a larger number of residents, identification and removal of barriers to the handoff process, and correlation of handoffs to clinical outcomes are key next steps.

Introduction

Improving inpatient handoffs is a major focus of efforts to enhance continuity of care and patient safety.¹⁻⁹ In contrast, ambulatory handoffs of patients by a graduating resident to a junior colleague have received relatively little attention in the medical literature, with the limited published data focusing primarily on patient satisfaction,^{10,11} safety concerns,^{12,13} balancing resident workloads,^{13,14} and improving care at the end of academic year transition.¹⁵ Ambulatory malpractice claims data demonstrate that breakdowns in handoffs contribute to about 20% of cases, suggesting that

communication issues and consequences occur in both ambulatory and inpatient settings.¹⁶

In 2010, an estimated 14 800 residents with a continuity clinic finished residency,¹⁷ likely accounting for more than a million transfers of care in the United States. Given the magnitude of this annual shift, it is important to better understand the components and risks of resident outpatient handoffs. Outpatient handoffs are unique: they need to convey important medical and psychosocial issues, such as the patient's living situation and access to health care; they occur in an almost simultaneous fashion, and they involve transition to a less experienced provider.

A practical way to facilitate improved, written, inpatient handoffs has been to apply a standardized electronic handoff tool¹⁸⁻²⁰ and to place it within an electronic medical record (EMR), as used by some inpatient services.²¹ As this aspect has not been addressed in the medical literature, we undertook a pilot study to identify the factors affecting the quality and performance of outpatient handoffs, hypothesizing that the number of completed handoffs and the quality of information conveyed in them could be increased by a simple standardized handoff intervention. We created a prototype

All authors are at Georgetown University. **Michael J. Donnelly, MD**, is Associate Professor of Medicine and Pediatrics; **Janelle Clauser, MD**, is Assistant Professor of Medicine and Pediatrics; and **Neil J. Weissman, MD**, is Professor of Medicine.

Funding: The authors report no external funding source for this study.

Corresponding author: Michael J. Donnelly, MD, MedStar Georgetown University Hospital, 6PHC, 3800 Reservoir Rd NW, Washington, DC 20007, 202.444.8866, mjd55@gunet.georgetown.edu

Received October 3, 2011; revision received February 6, 2012; accepted February 7, 2012.

DOI: <http://dx.doi.org/10.4300/JGME-D-11-00233.1>

TABLE 1	HANDOFF INSTRUCTIONS AND KEY ELEMENTS TO BE INCLUDED ^a
1.	Open a new “update” note.
2.	Label the header “Physician Handoff,” so other providers can identify it.
3.	Write the note—key elements to include are:
a.	Assessment of overall health status,
b.	Active problem list/medicines/allergies,
c.	Pertinent recent laboratory results,
d.	Tests or referrals needing follow up,
e.	Short-term concerns (during the next 2–3 mo)
f.	Long-term concerns (during the next 2–3 y)
g.	Psychosocial concerns

^a Adapted for outpatient handoffs from Flanagan et al,²² 2009.

EMR intervention encouraging graduating residents to perform a standardized outpatient handoff via an EMR note, and studied the number and quality of the handoffs performed.

Methods

Study participants were residents graduating from our internal medicine and combined internal medicine-pediatrics residency program. At the end of each academic year, graduating residents’ patients are assigned to an incoming intern. Of 15 graduating residents, all but 1 (93%) volunteered to participate.

Residents were randomized via an Internet-based tool (<http://www.randomize.org>) into an intervention and a control group. Seven residents (50%) were randomized to the intervention and sent an e-mail instructing them to write a short handoff note using the clinic’s EMR system (Centricity, General Electric, Fairfield, CT). They were encouraged to prioritize writing handoff notes for patients who were medically complex. The instructions were worded as follows: “I would ask you to write a short note on these patients identified as yours in the diabetes QI [quality improvement] project, or any other patients of yours that have multiple medical issues.” The e-mail included explicit instructions to open an empty text box and explained which key elements to include (TABLE 1). Residents were asked not to discuss the contents of the instructions to prevent contamination of the control group. A second, identical reminder e-mail was sent 1 week later to the intervention group. The 7 residents in the control group received an e-mail stating that no further instructions were forthcoming. Subjects in both groups were given 23 days to complete handoffs.

TABLE 2	LIST OF CATEGORIES FROM WHICH HANDOFFS WERE SCORED ^a
Category	Points
Assessment of overall health status	1
Active problem list	1
Medication list	1
Allergies and advanced directives	1
Past medical history	1
Recent laboratory results	1
Tests needing follow-up	1
Short-term concerns (over months)	1
Long-term concerns (over years)	1
Psychosocial concerns	1

^a Adapted for outpatient handoffs from Flanagan et al,²² 2009.

The chief resident and faculty sent an e-mail to residents in both groups to compose an e-mail handoff note as had been the practice in the past and conveyed the names of the interns to whom they would transfer their patients. Only the intervention group received detailed EMR instructions. None of the residents in the study received protected time to complete handoff notes.

Every resident’s EMR entries were reviewed from 14 days before the randomization date until 4 weeks after the end of residency. All handoffs were identified and scored by 2 independent, unblinded reviewers (M.J.D. and J.M.C.) using a predetermined point system. As no validated evaluation tool exists to assess outpatient handoffs, the scoring system was adapted from a validated, electronic, inpatient, handoff model.¹⁴ Zero or one point was awarded for each of 10 categories (TABLE 2), and a weighted κ was calculated to evaluate interrater reliability.

The Georgetown University Institutional Review Board approved the study, and all residents provided informed consent.

Results

Residents in the intervention group collectively completed 16 handoff notes (range, 0–6 per resident), and 5 of the 7 residents (71%) in the intervention group performed standardized EMR handoffs. Of those 5 residents, 3 (60%) performed 2 handoffs, 1 resident (20%) performed 4 handoffs, and 1 resident (20%) performed 6 handoffs. In addition, 3 patients of the 16 handoffs (19%) by residents in the intervention group were handed off via e-mails that were not available to the investigators. Residents in the control group completed zero EMR handoff notes.

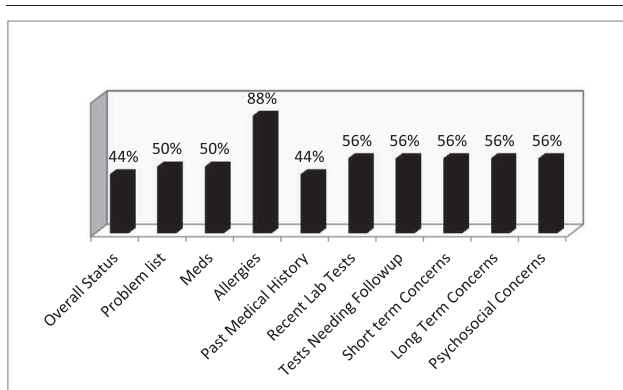


FIGURE | **PERCENTAGE OF HANDOFFS CONTAINING EACH SCORING CATEGORY**

Evaluation of the handoff notes produced a wide range of scores (range, 3–7 out of 10). Potential reasons for this include variation in patients' medical complexity, resident effort, or resident's judgment in recognizing the need for a handoff. The mean score was 5.56, and scores had excellent interrater correlation (weighted κ , 0.77).

The categories contained in each handoff are found in the FIGURE. Examination of the notes showed that most handoffs provided a paragraph of background information on the patient and then focused on recent clinical issues.

Discussion

Our pilot study suggests that a simple e-mail intervention instructing residents to use a standardized handoff process resulted in a modest increase in the number of outpatient handoff notes written in the EMR.

The published literature on inpatient and outpatient handoffs suggests that handoff content is critical, including new and existing clinical or psychosocial issues, pending tests, and clinical severity, whereas handoffs should also convey advice regarding longitudinal care.¹⁶ Many of the handoffs in our study focused on short-term concerns and tasks needing completion. We speculate that this may stem from residents' experience with inpatient handoffs, which have a short time horizon. Given the difficulties of arranging face-to-face handoffs at the end of residency and patients that often follow up with providers other than the primary resident, we thought a standardized procedure within the EMR would be most beneficial.

Our study has several limitations. First, few handoffs were performed by the residents in the study, and several residents in the intervention group e-mailed patient lists with short summaries to incoming interns outside of the EMR. These were not available for evaluation. It also is possible that handoffs within the EMR and those outside

of the electronic system were not identified by the investigators.

Including a standard template within the EMR may facilitate more consistent inclusion of important items in the handoffs, but further study of this aspect is needed.

We were unable to estimate the size of each resident's patient panel, which precluded an estimate of effect size. Although handing off all patients in a panel would be ideal, each resident likely had patients not handed off, who would have benefitted, suggesting a need to set expectations in terms of handoff quantity. Targeted, educational intervention on the importance of handoffs is necessary to change culture and to produce greater compliance with handoff expectations. Informal communication with the residents after the conclusion of the study revealed that lack of time was the primary barrier to performing handoffs. Providing protected time and setting expectations for the number of handoffs may be a successful way of increasing the number of handoffs performed.

Conclusions

The opportunity for the outgoing and incoming care providers to communicate is brief and improving resident communication at the end of residency has the potential to improve patient safety. Our study showed that a simple intervention increased the number of handoffs of ambulatory patients by graduating residents. A standardized tool promoting efficient and comprehensive handoffs, allowing protected time, and providing clear expectations for handoffs are steps we identified to improve this process. Future investigation should focus on validating a tool to measure handoff quality and the effect of handoffs on provider and patient satisfaction, patient safety, and clinical outcomes.

References

- 1 Joint Commission. The 2010 Ambulatory Care and Office-Based Surgery National Patient Safety Goals webpage. Oakbrook Terrace, IL: JC. http://www.jointcommission.org/NR/rdonlyres/CB66FD84-B071-4AEA-8EF4-FD00AC050470/0/July2010NPSGs_Scoring_AHC2.pdf. Accessed: July 2010, October 8, 2010.
- 2 Kohn L, Corrigan J, Donaldson, eds; for Committee on Quality of Health Care in America. *To Err is Human: Building a Safer Healthcare System*. Washington, DC: Institute of Medicine, National Academy Press, 2000.
- 3 Volpp KG, Grande D. Residents' suggestions for reducing errors in teaching hospitals. *N Engl J Med*. 2003;348(9):851–855.
- 4 Arora V, Johnson J, Lovinger D, Humphrey HJ, Meltzer DO. Communication failures in patient sign-out and suggestions for improvement: a critical incident analysis. *Qual Saf Health Care*. 2005;14(6):401–407.
- 5 Petersen LA, Brennan TA, O'Neil AC, Cook EF, Lee TH. Does housestaff discontinuity of care increase the risk for preventable adverse events? *Ann Intern Med*. 1994;121(11):866–872.
- 6 Riesenber LA, Leitzsch J, Massucci JL, Jaeger J, Rosenfeld JC, Patow C, et al. Residents' and attending physicians' handoffs: a systematic review of the literature. *Acad Med*. 2009;84(12):1775–1787.
- 7 Horwitz LI, Moin T, Green ML. Development and implementation of an oral sign-out skills curriculum [published online ahead of print August 3, 2007]. *J Gen Intern Med*. 2007;22(10):1470–1474.
- 8 Chu ES, Reid M, Schulz T, Burden M, Mancini D, Ambardekar AV, et al. A structured handoff program for interns. *Acad Med*. 2009;84(3):347–352.

- 9 Salerno SM, Arnett MV, Domanski JP. Standardized sign-out reduces intern perception of medical errors on the general internal medicine ward. *Teach Learn Med.* 2009;21(2):121–126.
- 10 Roy MJ, Herbers JE, Seidman A, Kroenke K. Improving patient satisfaction with the transfer of care. *J Gen Intern Med.* 2003;18(5):364–369.
- 11 Roy MJ, Kroenke K, Herbers JE. When the physician leaves the patient: predictors of satisfaction with the transfer of care in a primary care clinic. *J Gen Intern Med.* 1995;10(4):206–210.
- 12 Young JQ, Wachter RM. Academic year-end transfers of outpatients from outgoing to incoming residents: an unaddressed patient safety issue. *JAMA.* 2009;302(12):1327–1329.
- 13 Young, J, Niehaus B, Lieu SC, O'Sullivan PS. Improving resident education and patient safety: a method to balance initial caseloads at academic year-end transfer. *Acad Med.* 2010;85(9):1418–1424.
- 14 Young, JQ, Eisendrath, SJ. Enhancing patient safety and resident education during the academic year-end transfer of outpatients: lessons from the suicide of a psychiatric patient. *Acad Psych.* 2011;35(1):54–57.
- 15 Young JQ, Pringle Z, Wachter RM. Improving follow-up of high risk psychiatry outpatients at resident year-end transfer. *Jt Comm J Qual Patient Saf.* 2011;37(7):300–308.
- 16 Gandhi TK, Kachalia A, Thomas EJ, Puopolo AL, Yoon C, Brennan TA, et al. Missed and delayed diagnoses in the ambulatory setting: a study of closed malpractice claims. *Ann Intern Med.* 2006;145(7):488–496.
- 17 Brotherton SE, Etzel SI. Graduate medical education, 2010–2011. *JAMA.* 2011;306(9):1015–1030.
- 18 Van Eaton EG, Horvath KD, Lober WB, Rossini AH, Pellegrini CA. A randomized, controlled trial evaluating the impact of a computerized rounding and sign-out system on continuity of care and resident work hours. *J Am Coll Surg.* 2005;200(4):538–545.
- 19 Van Eaton EG, Horvath KD, Lober WB, Pellegrini CA. Organizing the transfer of patient care information: the development of a computerized resident sign-out system. *Surgery.* 2004;136(1):5–13.
- 20 Petersen, LA, Orav EJ, Teich JM, O'Neil AC, Brennan TA. Using a computerized sign-out program to improve continuity of inpatient care and prevent adverse events. *Jt Comm J Qual Improv.* 1998;24(2):77–87.
- 21 Stein DM, Stetson PD. Commentary: time to sign off on signout. *Acad Med.* 2011;86(7):804–806.
- 22 Flanagan, ME, Patterson ES, Frankel RM, Doebbling BN. Evaluation of a physician informatics tool to improve patient handoffs. *J Am Med Inform Assoc.* 2009;16(4):509–515.