

# Improving Handoffs: Implementing a Training Program for Incoming Internal Medicine Residents

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## ABSTRACT

**Background** The Accreditation Council for Graduate Medical Education Clinical Learning Environment Review program requires residents to receive training in handoffs, but there is limited information on best practices in implementing handoff training.

**Objective** We hypothesized that a bundled, standardized approach to handoffs during intern orientation would increase trainee comfort, confidence, and knowledge.

**Methods** All incoming internal medicine interns participated in a Care Transitions workshop during orientation that was divided into 3 sections: introduction and handoff videos using the I-PASS handoff tool, small group discussion of case scenarios, and a 1-on-1 handoff simulation with an evaluator. Participants completed pre- and postworkshop surveys. We reviewed handoff documents to assess whether residents continued to report illness severity—a key component of I-PASS—after the intervention.

**Results** Over 3 years, 225 of 229 (98%) interns completed the preworkshop survey, and 191 (83%) completed the postworkshop survey. Between 2014 and 2016, the number of incoming interns reporting prior training in handoffs during medical school increased from 45% to 63%. Interns' self-reported comfort with providing effective handoffs and self-reported confidence identifying factors essential to an effective verbal handoff (measured on a 5-point Likert scale) improved significantly after the intervention ( $P < .05$  for all questions and years). During 1 year, written handoffs for 28 498 patients were analyzed, and I-PASS illness severity was documented 99.4% of the time.

**Conclusions** The Care Transitions workshop consistently improved comfort, confidence, and knowledge of interns in performing handoffs and resulted in sustained change in handoff documentation.

## Introduction

The Accreditation Council for Graduate Medical Education (ACGME) Clinical Learning Environment Review (CLER) program formally states that handoffs should be standardized and efficient, and residents must be assessed for their ability to move from direct to indirect supervision.<sup>1</sup> The I-PASS handoff tool, a standardized process for care transitions, emphasizes illness severity and contingency planning, elements missing from many handoff discussions.<sup>2</sup> I-PASS implementation decreased preventable adverse events by 30% in a study of 9 pediatrics programs,<sup>3</sup> but information on its impact in internal medicine programs is limited.

Several residency programs developed curricula to teach handoffs using I-PASS, and many used simulation to assess residents' skills. These innovations led to improved knowledge<sup>4,5</sup>; however, there is limited postintervention data on changes in handoff practice.<sup>6,7</sup> Additionally, as entrustable professional activities are incorporated into medical school training,

including handoffs, the role of teaching handoff skills to interns as they begin residency is unclear.<sup>8</sup>

The study aim was to assess the effectiveness of utilizing a multimodal approach to teach incoming residents about handoffs and to determine if skills were maintained in clinical practice.

## Methods

### Settings and Participants

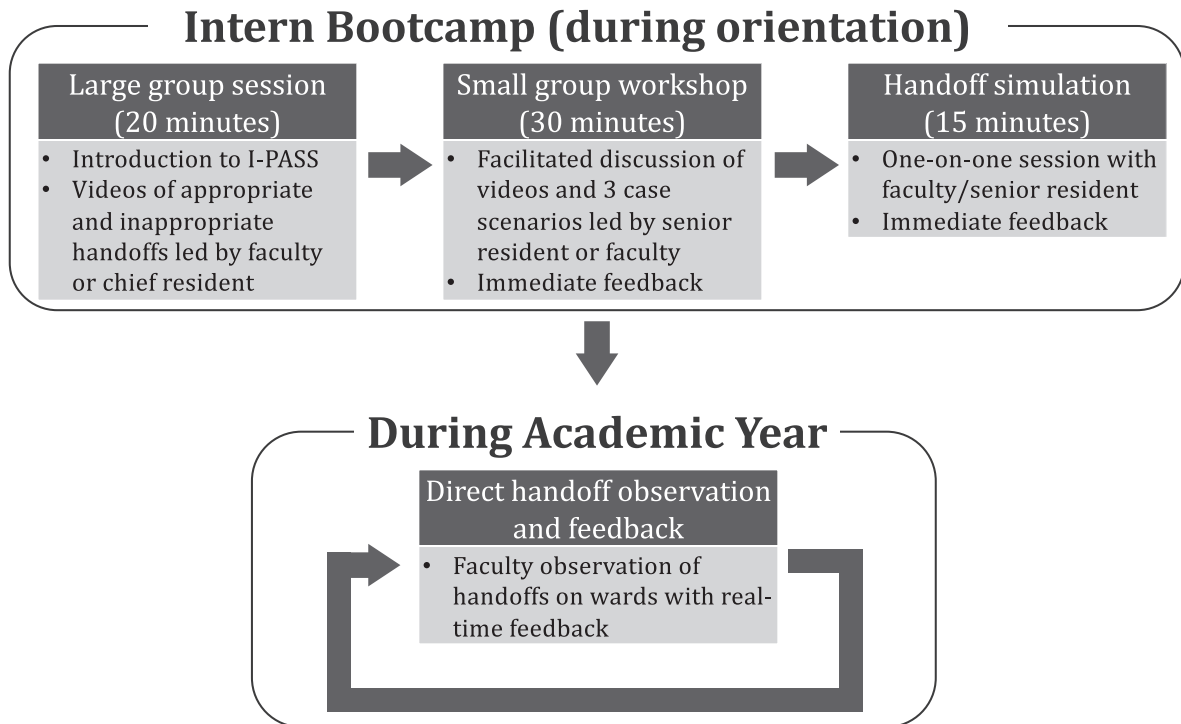
Our internal medicine residency is a large multisite training program. There were 73 interns in 2014 and 2015, and 83 in 2016. All interns attend a 1-day boot camp that included the handoff intervention during orientation.

### Intervention

The authors used a multimodal approach to provide I-PASS-based handoff training during boot camp starting in June 2014. I-PASS was not used prior to this intervention. The curriculum incorporated several instructional methods to adapt to various learning styles.<sup>9,10</sup> The workshop included large group didactics (20 minutes), a small group session (30 minutes), and a handoff simulation (15 minutes; see FIGURE 1). Facilitators were e-mailed in advance,

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*Editor's Note: The online version of this article contains the handoff evaluation form and the pre- and postworkshop surveys.*



**FIGURE 1**  
I-PASS Handoff Training Approach

and a 10-minute faculty training session led by the chief residents was held immediately before the session.

During the large group session, the facilitator discussed how poor communication contributes to medical errors and reviewed elements of effective handoffs using I-PASS. The small group session, facilitated by an upper-level resident or faculty member, included case examples where residents practiced giving and receiving handoffs and incorporating elements of I-PASS, such as identifying illness severity, effective patient summarization, action items, and contingency planning.<sup>2</sup> They received immediate feedback during this session.

Interns then rotated through stations of timed simulated cases, including one dedicated to handoffs. During the 15-minute handoff simulation, interns were given a sample list of 3 patients with varying acuity, performed handoffs, and received immediate feedback that they incorporated into a handoff with another patient. All handoffs were evaluated utilizing a checklist based on the ACGME Internal Medicine Milestones (provided as online supplemental material).

### Outcomes

We designed a 16-item survey instrument related to handoffs, with responses using a 5-point Likert scale. The survey evaluated prior training, knowledge, and comfort related to handoffs. We utilized an iterative

process, including a literature review and input from faculty at our institution, without further testing. Interns completed a preworkshop survey 1 month prior to the boot camp and an identical postworkshop survey 1 week after the boot camp (provided as online supplemental material). Data were collected for trainees entering the program from 2014 to 2016.

Written patient handoff documents were standardized to include all I-PASS elements. They were reviewed by 9 medicine teams at 1 site from April 2016 to March 2017 to evaluate whether residents continued to report illness severity—a key component of I-PASS—after the intervention.

The study was approved by the Baylor College of Medicine Institutional Review Board.

### Analysis

All pre- and postworkshop group analysis was performed using the Mann-Whitney *U* test, with *P* values of .05 or less considered significant. Survey results on handoff experience prior to residency and review of illness severity from written handoff documents were analyzed using descriptive statistics.

### Results

All 229 interns over 3 years received the surveys; 225 (98%) completed the preworkshop survey, and 191 (83%) completed the postworkshop survey.

TABLE

Summary of Handoff Experience Prior to Internal Medicine Residency Training

	2014 (n = 73)	2015 (n = 73)	2016 (n = 79)
Medical school had “transition to intern year” course (or similar), No. (%)	37 (51)	44 (60)	51 (65)
Received instruction on handing off a patient, No. (%)	33 (45)	43 (59)	50 (63)
Never handed off a patient in medical school, No. (%)	15 (21)	9 (12)	8 (10)

Interns reporting prior handoff training increased from 45% (2014) to 63% (2016; TABLE). Similarly, interns who reported performing handoffs in medical school increased from 79% (2014) to 90% (2016). Interns reported a significant postintervention increase in comfort with providing and receiving handoffs, identifying essential factors for verbal handoffs, and using the standardized I-PASS tool ( $P < .05$  for all years; FIGURE 2).

When asked how likely they were to change their handoff practices, the majority of interns answered *very likely* or *somewhat likely* (100% in 2014, 100% in 2015, and 91% in 2016). We analyzed 3203 written handoff documents representing handoffs for 28 498 patients and found that illness severity was noted on 99.4%. In general, faculty and chief residents observing handoffs after initiation of the intervention noted continued use of the I-PASS format.

### Discussion

Our study demonstrated that a multimodal teaching approach improves interns’ comfort and confidence in providing effective handoffs, resulting in sustained

use of the standardized tool in clinical practice. Repetition, practice of handoff skills, and immediate feedback likely led to increased retention and comfort levels.<sup>10</sup> Immediate feedback also allowed residents to form a mental model of how an effective handoff should be given.

Previous studies reported that simulation is an effective way to teach handoffs.<sup>4,5,11</sup> However, most evaluated a 1-year experience. Our study evaluated a handoff training program over 3 years and demonstrated continued compliance with I-PASS by evaluating handoff documents throughout the year. In our analysis, illness severity (a key component of I-PASS) was documented in 99.4% of patient handoffs compared with 88.9% of handoffs in the initial I-PASS study, which included resident training, faculty development, and a sustainability campaign.<sup>3</sup> Directly observing residents during boot camp helped identify those who could transition to indirect supervision and those who needed additional training. Surprisingly, our study highlighted a continued training gap in handoff education from medical school to residency, since 37% (29 of 79) of interns reported in 2016 that they had not received prior training. While the number of residents reporting

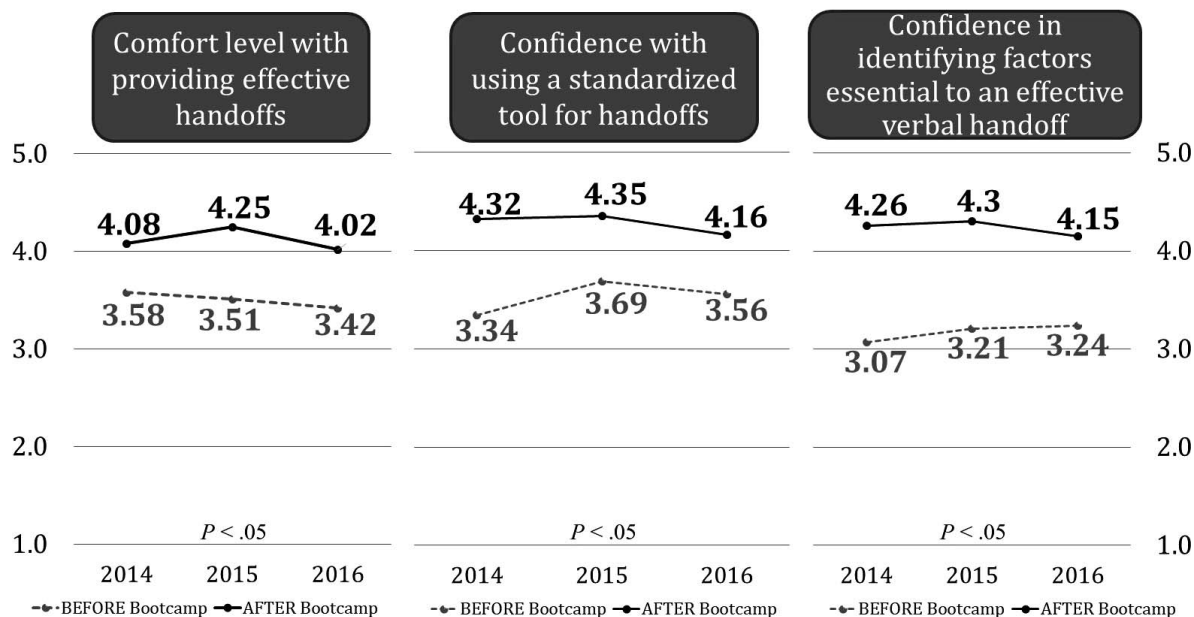


FIGURE 2 Outcome Measures of I-PASS Handoff Training Over 3 Years

prior training in handoffs has increased, interns' confidence and comfort in conducting a handoff prior to starting residency had not improved.

Our study has limitations. It was conducted for a single specialty and at a single institution, limiting generalizability. We estimated needing 28 facilitator hours, and the workshop may not be feasible for all programs. The intervention measured self-reported comfort without correlation with specific patient outcomes or safety metrics. Since most handoffs in our program are done by interns, we lack data on whether the impact of our intervention would be sustained for all 3 years of training.

Future studies are needed to identify how handoffs are currently being taught in medical school. Use of an educational strategy with workshops and simulation with immediate feedback may improve interns' confidence and comfort when they enter residency. With more robust handoff training and competency assessments in medical school, residency programs could likely better align with CLER aims by focusing on clinical site specifics or interprofessional handoffs rather than general concepts.<sup>1</sup>

## Conclusion

A formal training workshop followed by a simulated exercise during intern orientation consistently improved interns' comfort and confidence in performing handoffs and resulted in nearly universal reporting of illness severity, a key component of the I-PASS handoff instrument.

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