

## **Title Page**

**Title of Project:** Mentored Implementation of I-PASS for Better Handoffs and Safer Care

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## **Structured Abstract**

**Purpose:** Provider handoffs of care are a leading source of miscommunications and adverse events. Although prior research demonstrated the benefit of a handoff improvement program (“I-PASS”) for pediatric resident physicians, the extent to which this program could be adapted and implemented in alternate contexts was unknown. The purposes of the study were 1) to adapt, disseminate, and measure the effectiveness of I-PASS implementation in collaboration with the Society for Hospital Medicine’s Mentored Implementation Program and 2) to build a toolkit to promote widespread dissemination.

**Scope:** We conducted an intervention cohort collaborative consisting of two 18-month-long waves of participation across 32 hospitals.

**Methods:** We adapted the I-PASS handoff program for use in adult as well as pediatric providers and offered more flexible training and implementation options. Each site had an external mentorship team that provided ongoing coaching. Programwide webinars and monthly data reports reviewed the status of key implementation metrics. Validated handoff observation tools assessed verbal and written handoff quality and systematically collected provider reports of handoff-related adverse event rates.

**Results:** Implementation was associated with increased inclusion of all five key handoff data elements for both verbal (21% vs 64%) and written (10% vs 67%) handoffs. Additionally, increases were observed in the frequency of high-quality verbal (31% vs 73%) and written (55% vs 71%) patient summaries and verbal receiver syntheses (47% vs 78%). Handoff-related adverse events decreased by 42%. All changes were  $p < 0.05$ . Improvements were similar across provider types and settings.

**Key Words:** handoff, I-PASS, communication, adverse events

## **PURPOSE:**

### **Objectives of the Study**

Communication failures are a leading cause of sentinel events in hospitals. In turn, poor-quality handoffs between providers are known to be a primary source of miscommunications.<sup>1</sup> Handoffs have consequently been identified by the Agency for Healthcare Research and Quality (AHRQ)<sup>2</sup> and The Joint Commission<sup>3</sup> as a top patient safety goal. Over the past several years, research on handoff tools and processes has identified specific strategies with the potential to improve handoffs and reduce medical error, including teamwork and communication training<sup>2</sup> and the implementation of structured processes for verbal<sup>4-6</sup> and written/computerized<sup>7</sup> handoff communication.

Until recently, however, high-quality data demonstrating the effectiveness of handoff improvement efforts were lacking. A systematic review in 2013 found few objective data to inform a strategic approach to improving handoffs, as most studies relied on nonvalidated provider surveys alone, with little collection of objective data on effectiveness.<sup>8</sup>

To address the need for improved handoffs, we previously developed and implemented a bundle of interventions we hypothesized would be synergistic, rather than implementing teamwork training alone or changes to the verbal or written handoff process in isolation. Implementation of a pilot bundle consisting of didactic handoff training, a verbal mnemonic, and a computerized handoff tool at Boston Children's Hospital was associated with reductions in handoff miscommunications, improvements in resident workflow (less time at the computer, more time in direct patient care), and – most importantly – a significant reduction in serious medical errors.<sup>9</sup>

We subsequently conducted a multicenter project in which we refined the intervention for implementation in nine pediatric residency programs within leading teaching hospitals in the U.S. and Canada (DHHS R18 AE000029) from September 2010 – August 2013. “**I-PASS**,” our handoff program, included multimodal delivery of teamwork and handoff training built in part on the TeamSTEPPS program, handoff simulation training exercises, introduction of a verbal mnemonic, changes to the verbal handoff process (including teamwork process and environment changes), a printed handoff tool, faculty development materials, and a culture change campaign. Implementation of this refined handoff intervention was associated with a 30% reduction in rates of preventable adverse events and significant improvements in handoff content and quality across participating sites.<sup>10</sup>

Given the ubiquity of handoff problems in hospitals and the success of our multifaceted handoff program, we believed that further dissemination and implementation of I-PASS could have an important impact on patient safety. The objective of this study was therefore to adapt and implement I-PASS for use in small and large adult and pediatric hospitals. To do so, in collaboration with the Society of Hospital Medicine (SHM) and the Pediatric Research in Inpatient Settings (PRIS) network, we employed SHM's award-winning “Mentored Implementation” methodology, a proven vehicle for carrying out a wide range of multicenter quality improvement initiatives.<sup>11</sup>

Our **specific aims** were:

1. To develop a robust process for implementing and disseminating I-PASS through the Society for Hospital Medicine's Mentored Implementation Program.

2. To effectively enact the I-PASS Mentored Implementation Program in 32 teaching hospitals. Success was to be measured by penetrance of the program and adherence to proven handoff processes as well as by resident and faculty physician handoff experience. We anticipated training 90% of resident physicians at each study site in I-PASS techniques; adherence with I-PASS processes in 75% of verbal and written handoffs; and greater than 80% rates of satisfaction with the I-PASS mentored implementation program.
3. To build a toolkit to promote widespread dissemination of I-PASS through the Pediatric Research in Inpatient Settings Network, the Society for Hospital Medicine, and beyond.

## SCOPE

### Background

The Joint Commission identifies communication errors as a contributing cause in approximately two out of every three “sentinel events” – the most serious adverse events in hospitals; over half of these communication errors involve handoff failures.<sup>11</sup> The “handoff,” or transfer of patient information and responsibility between healthcare providers, is a critical point of vulnerability to communication error. Several studies have found that there is often little standardization in the process or content of handoffs<sup>12–14</sup> and that most providers receive no formal handoff training.<sup>12</sup> Furthermore, omissions of critical information – as well as provision of outdated or frankly erroneous information – occur very frequently.<sup>15</sup> Several developments in the healthcare system have exacerbated handoff problems, including increasing patient complexity and the introduction of provider work hour reductions.<sup>16,17</sup>

A preliminary study at Boston Children’s Hospital and a subsequent multicenter study of pediatric resident physicians demonstrated that implementation of a structured handoff communication program was associated with improved handoff communication quality as well as reductions in rates of preventable adverse events.<sup>9,10</sup> The handoff improvement bundle tested in the multisite study included six major complementary components organized around “**I-PASS**”— a mnemonic for the core structure and key elements of the handoff process.<sup>18</sup> I-PASS, which comprises **I**llness severity, **P**atient summary, **A**ction list, **S**ituational awareness/contingency planning, and **S**ynthesis by receiver, includes key elements of the handoff communication process that are critical from a patient safety perspective yet often omitted from the handoff process. In addition to the mnemonic structure, the components include (1) integration of the I-PASS structure into verbal and written handoff processes, including I-PASS structured computerized handoff tools; (2) training workshops to teach teamwork and handoff communication skills; (3) a role-play session; (4) faculty development; (5) direct-observation quality improvement tools to provide feedback and enhance adoption; and (6) a visual reinforcement and culture-change campaign to ensure adoption and sustainability.<sup>19–22</sup>

Despite these successes, it remained unclear the extent to which the I-PASS handoff program would generalize beyond pediatric resident physician handoffs or in more real-world settings without the significant support of onsite research study staff from a federally funded research trial. Furthermore, all the site leads in the I-PASS study participated extensively in the development of the I-PASS curriculum, so it was unclear how to best implement in settings without prior I-PASS implementation experience.

However, given the ubiquity of handoff problems in hospitals, we hypothesized that further dissemination and implementation of I-PASS could have an important impact on patient safety. Therefore, to disseminate the findings of the original I-PASS study and to better understand the potential for generalizability, the objective of this study was to implement the I-PASS handoff program across a variety of hospitals and medical specialties, measuring the association of I-PASS implementation with handoff quality and rates of handoff-related adverse events.

### **Context, Setting, and Participants**

Following approval by Boston Children's Hospital institutional review board (IRB), we conducted a prospective intervention study across 32 hospitals with resident physician services that participated in two 18-month-long waves of implementation, including 16 hospitals, each between 2015 and 2017 (Wave 1: April 2015 – August 2016; Wave 2: April 2016 – August 2017). All participating sites received either local IRB approval or an IRB waiver indicating that the study was a quality improvement effort at the local site level and a research effort centrally at Boston Children's Hospital.

Of more than 80 hospitals that applied to participate, we selected a distribution of academic (n=20) as well as community (n=12) hospital sites caring for pediatric (n=12), internal medicine (n=13), and other adult (n=7) patients. Hospitals were instructed to identify one or two units of implementation focus. A mean of 87 residents (ranging from minimum of 13 to maximum of 274) and 25 faculty champions (ranging from a minimum of three to a maximum of 98) participated as study subjects across the 32 hospitals.

## **METHODS**

### **Study Design**

We conducted a prospective intervention study across 32 hospitals as described above. The study was organized into two waves of implementation that included 16 hospitals each. Both waves of participation lasted 18 months in duration and included the participation in a programwide quality improvement collaborative using a mentored implementation approach overseen by the Society for Hospital Medicine.

### **Data Sources/Collection**

All participating sites collected data that were analyzed centrally so that, each month, sites received an updated dashboard detailing their performance benchmarked to the aggregate data for 22 measures of handoff adherence and quality. Handoff assessment tools addressed the verbal and written handoff process to report the inclusion and quality of key handoff data elements. Handoff observers were instructed to observe multiple patients being handed off within a handoff session and to record their general impressions across all patient discussions. Specific measures included the adherence to all five elements of the I-PASS structure (Illness severity statement, Patient summary, Action list, Situational awareness and contingency planning, and Synthesis by receiver) for both verbal and written handoffs. Adherence was assessed on a five-point frequency scale (never, rarely, sometimes, usually, always), with responses reported as the percentage in which responses were usually or always adhering to all five elements. Additional measures assessed the quality of the verbal/written patient summary, the verbal/written contingency plans, and the verbal synthesis by receiver on a five-point quality scale (poor, fair, good, very good, excellent), with responses reported in a

dichotomized manner as the percentage of observations in which quality was very good or excellent.

To assess training penetrance and resident and faculty experiences with the program, a survey was administered to all residents and faculty assessing their experience with handoffs at baseline and then on a monthly basis during the intervention and sustainment phases at all sites. A site champion survey was also sent to the primary site lead from each participating site immediately after participation as well as 12 months after participation in the program to assess perceptions of sustainability and dissemination of the program.

To assess the rate of handoff-related adverse events, we systematically approached front-line resident providers each month who rotated onto the unit of implementation focus and asked them to estimate the number of patients who experienced a minor or major harm as a result of a problematic handoff. The duration of the most recent period of service was also recorded for each resident, and the adverse event rate was normalized according to the number of events per person-year. Minor harm was defined as a limited clinical consequence, such as a need for more frequent monitoring or transient discomfort without prolongation of hospitalization, significant organ dysfunction, or worsening of clinical condition. Major harm was defined as significant clinical consequences, such as deterioration in clinical status, organ dysfunction, prolonged hospitalization, disability beyond discharge, or death.

## **Interventions**

This project provided the opportunity to enhance and adapt all of the I-PASS curricular and implementation materials for adult as well as pediatric providers. We developed a robust implementation guide for site leads that extensively detailed key implementation steps and milestones.<sup>23</sup> Specific focus was placed on eight key areas of implementation focus: 1) establishing institutional support for prioritization of the initiative and building a multidisciplinary I-PASS implementation team; 2) conducting a needs assessment and developing process maps describing the baseline and ideal handoff state; 3) planning for high-quality implementation of the introductory I-PASS handoff curricular content; 4) engagement of I-PASS champions in live observations of handoffs; 5) data collection procedures to ensure regular and ongoing measurement of implementation success; 6) revision of existing computerized and/or written handoff tools to fit a standard I-PASS structure; 7) implementation of a visual reinforcement campaign tailored to the local environment; and 8) development of strategies to motivate ongoing involvement of I-PASS champions over time.

Additional training modalities were also developed to allow for more flexible and independent learning compared with the curriculum developed for the original pediatric I-PASS study trial. These instructional resources included 1) 20-minute self-study educational video modules for front-line providers and I-PASS champions and 2) in-person educational modules reviewing I-PASS handoff techniques and team communication strategies for a) front-line providers (90-minute workshop involving didactic content, discussion of trigger videos, and role-play simulations), b) I-PASS champions (60-minute session focused on how to observe and give feedback on handoffs as well as how to adapt the program for individual institutional needs and overcome anticipated implementation barriers), and c) key institutional leaders (60-minute presentation targeted at key leaders, such as CMOs, CEOs, department chairs, CIOs, and safety officers, reviewing evidence-basis for structured handoffs and high-level implications of having an effective handoff program for an institution). Printed educational materials, such as

written handoff exercises, evaluation forms, and implementation worksheets, were also developed to be used in conjunction with the training materials.

The mentored implementation process used in the study is an approach previously developed by the Society of Hospital Medicine to facilitate multicenter dissemination of quality-improvement initiatives.<sup>24</sup> Each participating site was paired with an external mentorship team, including two physicians with prior I-PASS implementation experience and access to a central program coordinator and data analyst. Sites participated in monthly conference calls with their mentors to receive coaching and to review how the site was doing on programwide measures of implementation. During the 4- to 6-month planning and training phase, mentors ensured that all sites completed standard implementation milestones. All sites collected a minimum of 12 months of data. Over the course of the 18-month period, sites participated in quarterly programwide collaborative conference calls, and the mentorship team conducted a site visit to the hospital to meet with key stakeholders.

## **Measures**

We applied logistic and Poisson regression to assess I-PASS adherence and the quality of the handoff process and to measure the adverse event rate over time, adjusting for hospital-level clustering with a random-effects model. For analysis purposes, the data was grouped into timepoints of baseline, the first 6 months of implementation, and the last 6 months of implementation. Although our primary analyses looked at changes in I-PASS adherence and quality over time, we also conducted secondary analyses comparing adherence to the I-PASS structure between the two different waves of participation, for academic versus community hospitals, for adult versus pediatric patients, and for interns versus senior-level resident physicians. Two-sided p values < 0.05 were considered statistically significant. All analysis was completed using SAS/STAT version 9.2 (SAS Institute, Inc).

## **Limitations**

Our project does have some important limitations in that we focused on resident physician end-of-shift handoffs; therefore, the extent to which the I-PASS structure and approach are generalizable to additional handoff or provider types is unclear, which is an area of very active ongoing work for our team. Additionally, to assess adverse event frequency, we relied on systematic error surveillance that was integrated into routine workflow of resident providers through monthly requests for provider report. Although this mechanism of error surveillance was less intense than methodologies used in some of our prior work, we are very interested to develop a more feasible and cost effective way to assess errors that would be more generalizable outside the context of a research study. Finally, it remains important to consider ways to scale implementation efforts beyond mechanisms such as the one used in this project of a federally funded, large-scale, QI collaborative.

## **RESULTS**

### **Principal Findings and Outcomes**

#### *Training Penetration*



All 32 sites successfully recruited I-PASS champions (key individuals or clinicians that care for patients and are opinion leaders) who ensured training of front-line providers (resident physicians rotating onto units of focus) by scheduling training sessions and interactive workshops to teach handoff communication skills, providing simulations and role-play exercises, incorporating sessions into provider orientation, and providing online modules.

We found that a mean of 92.4% of front-line providers (n=2099) at all 32 participating sites reported receiving training or explicit instructions on how to perform a handoff using the I-PASS techniques. Also, 70.2% of providers stated that the overall quality of the training they received was very good or excellent.

*Handoff Observations*

Faculty participants at each site observed 3799 verbal handoff sessions (mean of 10 observations per site per month) and reviewed 1620 printed handoff documents (mean of four observations per site per month) to assess adherence to the I-PASS structure and handoff quality. Implementation of the I-PASS handoff program across all 32 sites was associated with a marked improvement in the percentage of handoffs that included all five elements of the I-PASS handoff structure for both verbal and written handoff communications (Figure 1).

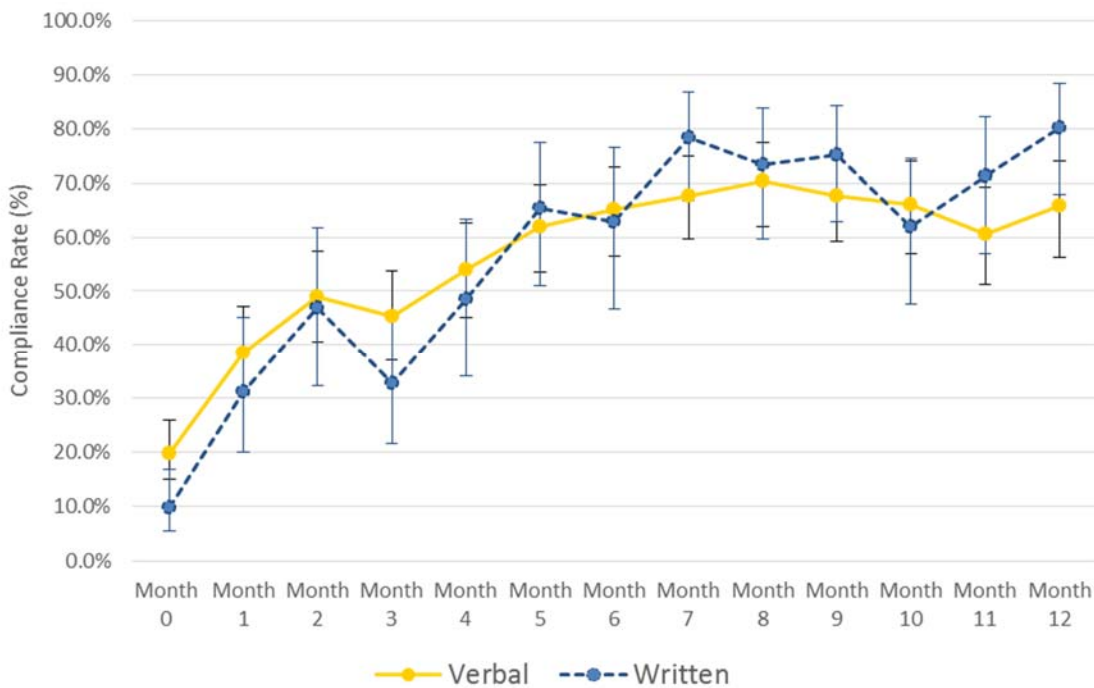


Figure 1. Adherence to all five I-PASS data elements (Illness Severity, Patient Summary, Action List, Situation Awareness and Contingency Planning, Synthesis by Receiver). Reported as percentage of observed handoffs usually or always adhering to all five elements.

There were no significant differences in the extent to which adherence improved over time when comparing the characteristics of study wave, community versus academic setting, specialty, or level of training, with the small exception that hospitals caring for adult patients achieved a slightly higher rate of adherence compared with those caring for pediatric patients (Figure 2).

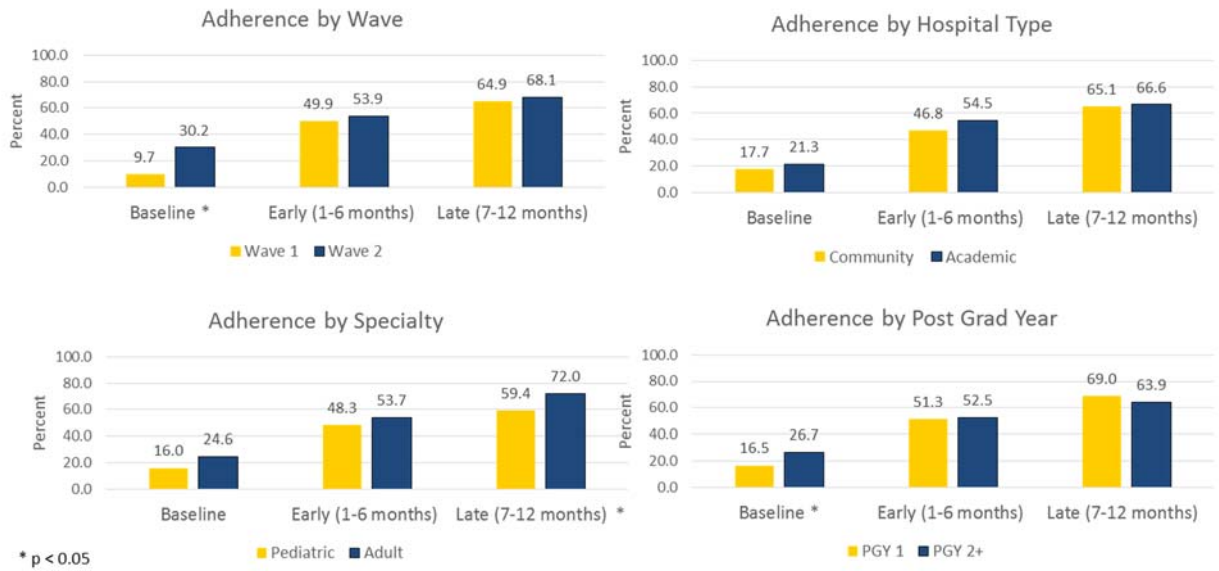


Figure 2. Verbal adherence to all five elements of I-PASS structure according to wave of participation, hospital type, specialty, and post-graduate year. Reported as percentage of observed handoffs usually or always adhering to all five elements.

Similarly, when looking at adherence to all five elements of the I-PASS structure for written handoffs, although community hospitals took a bit longer to improve adherence to the written I-PASS structure, there were no significant differences in the extent to which adherence was achieved when comparing wave of participation, hospital setting, or pediatric versus adult setting (Figure 3).

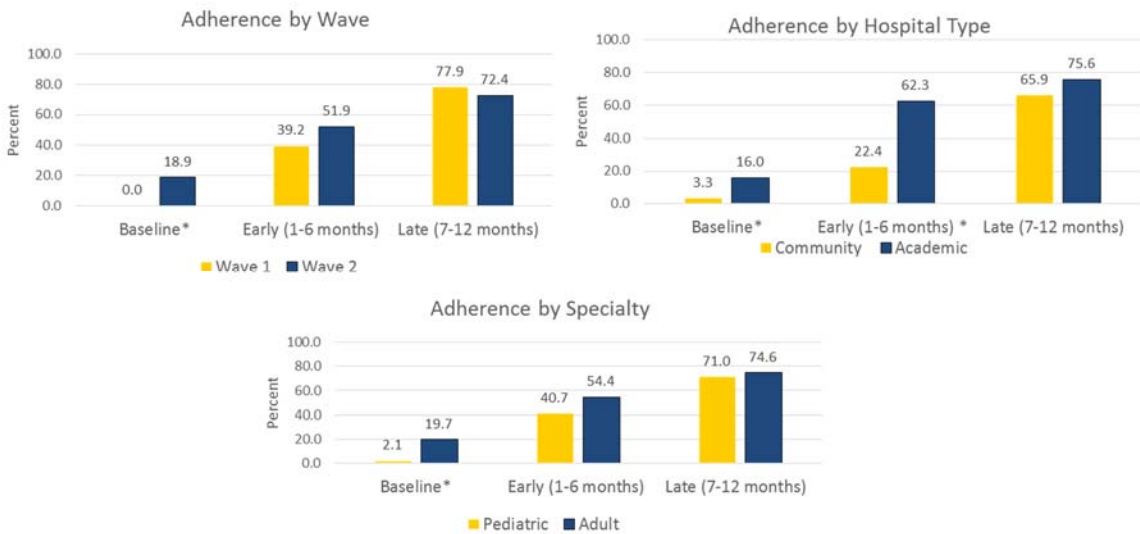


Figure 3. Written adherence to all five elements of I-PASS structure according to wave of participation, hospital type, and specialty. Reported as percentage of written handoffs usually or always adhering to all five elements.

Over time, there were significant improvements in the percent of verbal and written handoffs that included very good or excellent quality of patient summaries, contingency plans, and a high-quality synthesis by the receiving physician (Figure 4).

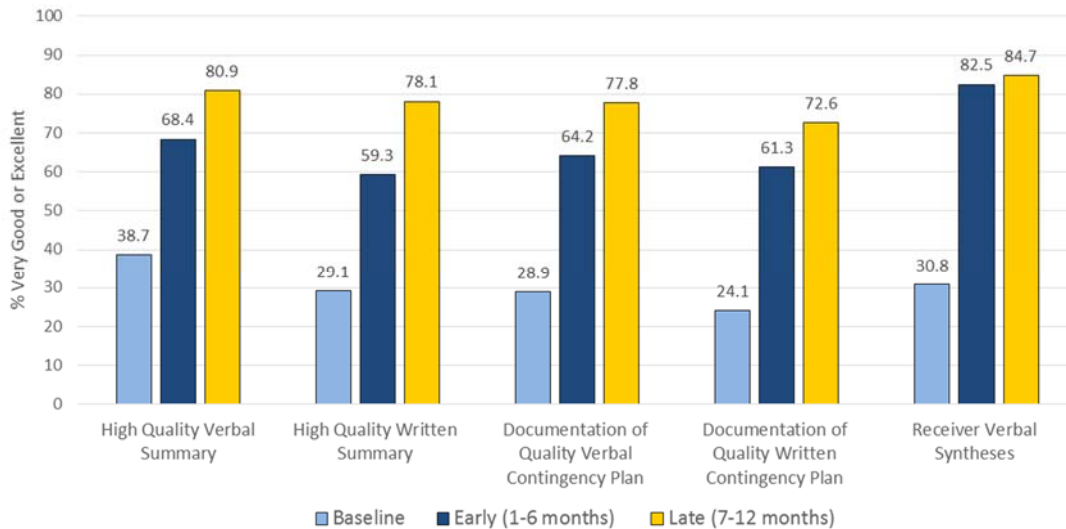


Figure 4. Quality of verbal and written handoff communication. Reported as the percentage of observed handoffs rated very good or excellent.

*Handoff-related Adverse Events*

In total, 1698 reports of handoff-related adverse events were collected from front-line provider resident physicians (response rate of 58.6%). Across all sites combined, mentored implementation of the I-PASS handoff program was associated with a 47.1% reduction in the frequency of handoff-related major adverse events ( $p < 0.05$ ) as well as a 46.9% reduction in handoff-related minor-harm events ( $p < 0.001$ ) (Figure 5).

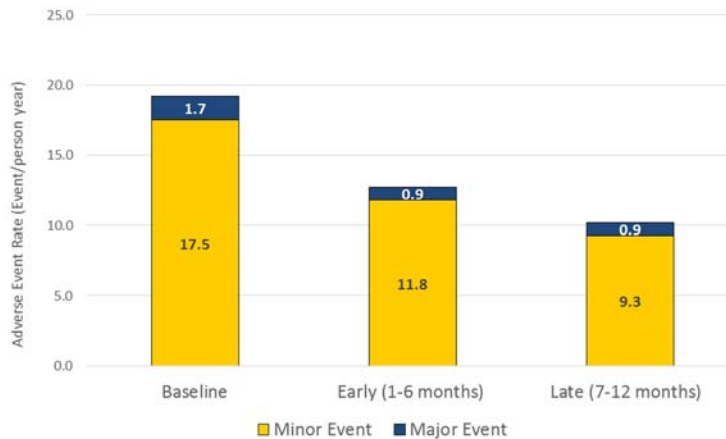


Figure 5. Rate of handoff-related adverse events. Reported as the number of events per person-year for both major and minor handoff-related adverse events.

*Site Lead Experience: Perceptions of Sustainability and Dissemination*

A survey was sent to site leads at the end of the period of participation in the project (n=30 of 32 sites responded, response rate of 93.8%) as well 12 months after participation (n=26 of 32 sites responded, response rate of 81.3%). Whereas 2.6% site leads rated the quality of handoffs on the unit of focus as very good or excellent prior to participation, this percent increased to 84.6% of site leads immediately after participation and was sustained at 71.9% 1 year post-implementation. At 1 year post-participation, 87.5% of site leads reported that the use of I-PASS was sustained in the units of focus to a moderate or great extent, and 40.6% of sites reported that they were still independently collecting quality improvement data to monitor handoff quality. Additionally, 78.1% of site leads reported that I-PASS had already spread to additional units/provider types/handoff types beyond the area of initial focus 1 year after implementation. One year after participation, site leads reported multiple areas in which the components of the I-PASS program were sustained or disseminated to other units/specialties/handoff types (Figure 6a and 6b), with 78.1% of site leads reporting that I-PASS had transitioned from a pilot program to an institutionalized program with permanent status in the hospital handoff culture.

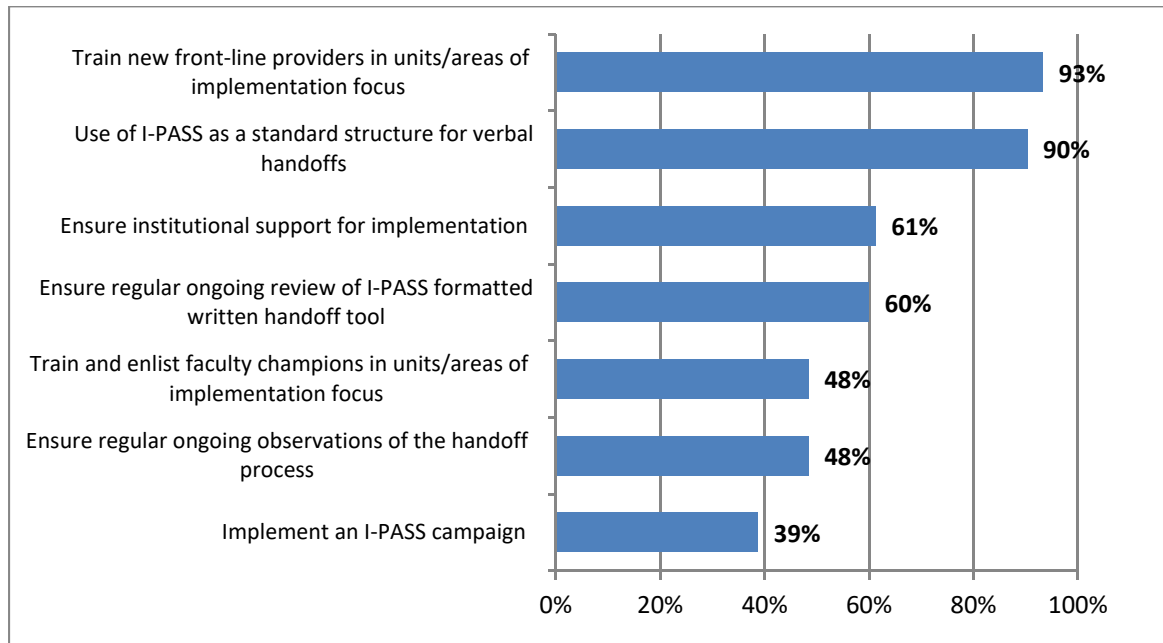


Figure 6a. Extent to which various components of the I-PASS handoff program were sustained 1 year post-participation.

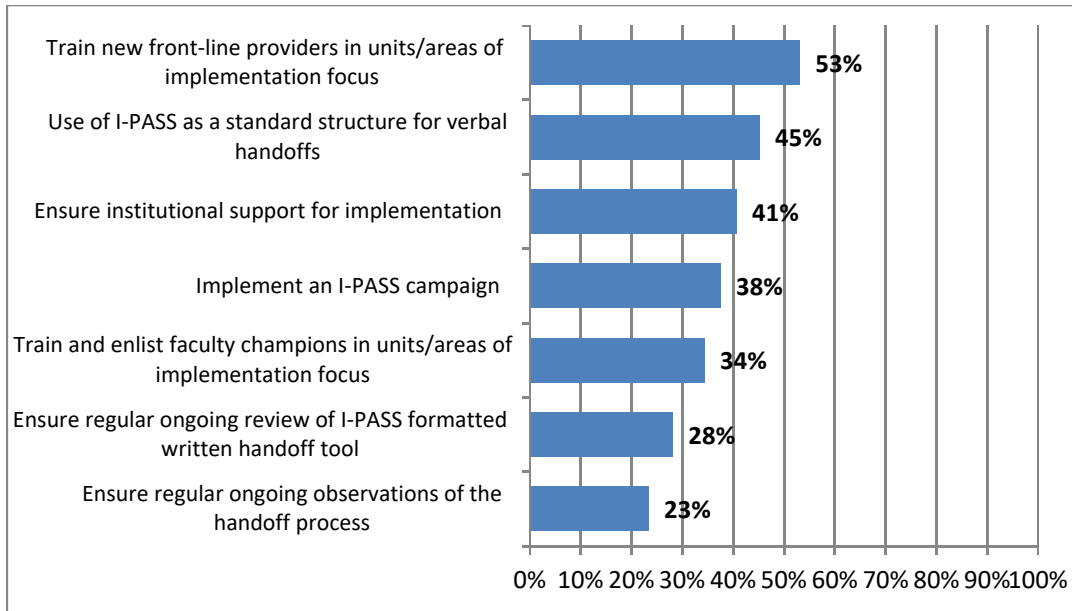


Figure 6b. Extent to which various components of the I-PASS handoff program were disseminated to other units/specialties/handoff types 1 year post-participation.

In addition, site leads were able to recognize and rate the extent to which a variety of factors were either barriers (Figure 7a) or facilitators (Figure 7b) to I-PASS sustainment and dissemination efforts.

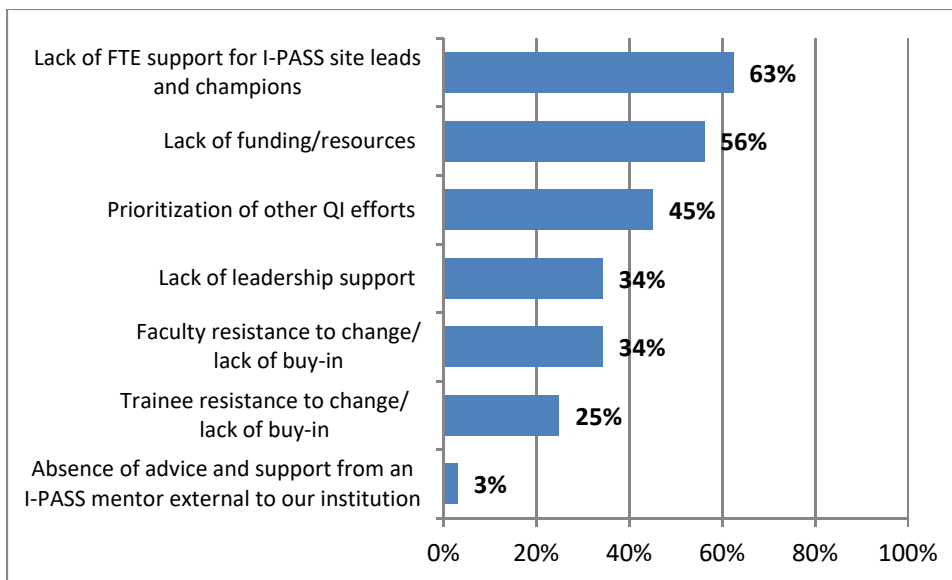


Figure 7a. Extent to which factors served as barriers to I-PASS sustainment or dissemination efforts. Reported as the percent of site leads who viewed each factor as a contributing element to either a moderate or a great extent.

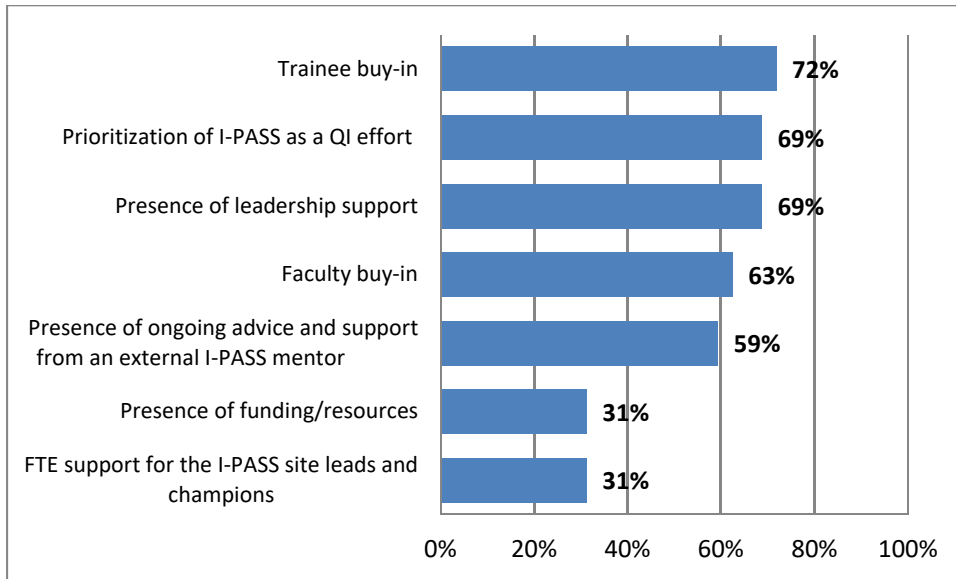


Figure 7b. Extent to which factors served as barriers to I-PASS sustainment or dissemination efforts. Reported as the percent of site leads who viewed each factor as a contributing element to either a moderate or a great extent.

## Discussion

We found that adaptation and implementation of the I-PASS handoff bundle for resident physicians across 32 hospitals with a variety of settings and provider types was associated with significant improvements in the inclusion of key handoff data elements as well as a significant reduction in rates of handoff-related adverse events. Of note, improvements were found to be similar across provider types (adult vs pediatric) and settings (community vs academic). Site champions reported high rates of both sustainability of the intervention as well as independent dissemination success within their own institutions 1 year post-participation in the program.

Prior studies have raised substantial concerns with both the process and content of handoffs, with adverse events identified to occur more frequently during times of cross-coverage.<sup>25,26</sup> Furthermore, direct observation and survey-based studies have found little standardization in the process of content of handoffs and have identified high rates of miscommunications.<sup>12-14</sup> Although limited research has identified multiple specific strategies with the potential to improve handoff communication, including teamwork and communication training, implementation of handoff mnemonics and other verbal handoff process improvements, and the implementation of structured written or computerized handoff tools, these techniques have most often been implemented in isolation within single centers as opposed to in a bundled manner across multiple institutions concurrently.

The nine-institution, multisite, pediatric I-PASS Study represented a first step toward addressing these gaps in the field, demonstrating a 30% reduction in rates of preventable adverse events after implementation of a structured communication bundle.<sup>10</sup> However, this original I-PASS research effort was limited to tertiary pediatric residency programs supported by the infrastructure of a research trial, with uncertainty as to the potential for broad generalizability and extent to which adaptation would be required in more diverse settings.

Although some preliminary small efforts have demonstrated promising potential to adapt the I-PASS process for other provider types such as nurses,<sup>27</sup> medical students,<sup>28</sup> and other physician specialties such as psychiatry<sup>29</sup> and emergency room<sup>30</sup> providers, the outcome data on the impact of these implementation efforts have been significantly limited, and these studies all involved single institutions. Shahian et al perhaps have reported the most robust larger-scale attempt at I-PASS implementation through their report on adaptation of the program across an entire institution, yet their efforts were limited by a number of identified barriers to implementation success, and data describing the outcomes of their efforts were limited to the percentage of providers trained and by the nonuniform adoption of I-PASS across providers.<sup>31</sup> We believe that our large-scale, 32-institution adaptation with successful implementation of the I-PASS handoff program is the first of its kind to confirm the significant potential for broad application and impact of structured handoff programs on patient safety.

## Conclusions, Significance, and Implications

In conclusion, we found that implementation of the I-PASS handoff program was associated with increased inclusion of key handoff data elements, improvements in the quality of handoff communication, and a significant reduction in rates of handoff-related adverse events and that these improvements appeared to be remarkably similar across a variety of provider types and settings. Since the conclusion of the study, we have worked to actively disseminate our findings in professional meetings and publications. Additionally, the curriculum has been published as a toolkit of implementation resources and is now freely available to support further dissemination.<sup>23</sup> Given the high frequency of handoff-related errors and communication problems in hospital settings, the further dissemination of high-quality handoff improvement programs has the potential for significant benefit. Additional work to improve and standardize handoffs across additional specialties and settings may lead to improvement in the safety of patients in hospitals nationwide.

## LIST OF PUBLICATIONS AND PRODUCTS

### Publications

Starmer AJ, Spector ND, West DC, Srivastava R, Sectish TC, Landrigan CP; and the I-PASS Study Group. Integrating Research, Quality Improvement, and Medical Education for Better Handoffs and Safer Care: Disseminating, Adapting, and Implementing the I-PASS Program. *The Joint Commission Journal on Quality and Patient Safety*. 2017 Jul;43(7):319-329.

O'Toole J, Starmer A, Calaman S, Campos M-L, Goldstein J, Hepps J, Maynard G, Owolabi M, Patel S, Rosenbluth G, Schnipper J, Sectish T, Srivastava R, West D, Yu C, Landrigan C, Spector N, Committee on behalf of the I-PSEE. I-PASS Mentored Implementation Handoff Curriculum: Implementation Guide and Resources. *MedEdPORTAL*. 2018;(14). doi:[10.15766/mep\\_2374-8265.10736](https://doi.org/10.15766/mep_2374-8265.10736).

O'Toole J, Starmer A, Calaman S, Campos M-L, Goldstein J, Hepps J, Lopreiato J, Patel SJ, Rosenbluth G, Schnipper J, Sectish TC, Srivastava R, West DC, Yu C, Landrigan CP, Spector ND, Committee on behalf of the I-PSEE. I-PASS Mentored Implementation Handoff Curriculum: Champion Training Materials. *MedEdPORTAL*. 2019; In Press.

Starmer, AJ, O'Toole JO, Spector N, West D, Sectish T, Schnipper J, Srivastava R, Goldstein J, Campos ML, Howell E, Landrigan C, SHM I-PASS Study Group. *BMJ Quality and Safety* 2016; 25:1009-1010.

### **Selected Platform/Plenary Research and Workshop Presentations**

- 2015 I-PASS: Spreading an Evidence-based Program Across the Institution for Safer Transitions of Care (3-hour Workshop)  
PAS Annual Meeting, San Diego, CA
- 2016 I-PASS: Spreading an Evidence-Based Program across the Institution for Safer Transitions of Care (Workshop)  
ACGME Annual Educational Conference
- 2016 Strategies for Implementing a Successful Handoff Program for Hospitalists: Lessons learned from the SHM-IPASS Mentored Implementation Program  
Society for Hospital Medicine Annual Meeting, San Diego, CA
- 2016 Leading Effective Collaborative Education and Improvement Efforts to Ensure Improved Outcomes Locally and Beyond  
Alliance for Continuing Education in the Health Professions Annual Conference
- 2016 I-PASS: Improving Patient Safety by Standardizing Provider Communication and Improving Transitions of Care (Keynote Speaker)  
MedNax Continuous Quality Improvement Symposium
- 2016 Handoff Communications Standardization Program for VA Hospitals (Webinar)  
Veteran's Administration National Center for Patient Safety
- 2016 Mentored Implementation of the I-PASS Handoff Program in Diverse Clinical Environments (Platform Research)  
Institute for Healthcare Improvement Scientific Symposium
- 2017 Mentored Implementation of the I-PASS Handoff Program in Diverse Clinical Environments  
Pediatric Academic Societies Annual Meeting
- 2017 A Method for Reduction of Medical Error and Prevention of Adverse Events: I-PASS — A Solution Within Reach



Sanatorio Mater Dei/MALBA Museum of Modern Art  
 Buenos Aires, Argentina

- 2017 Strategies for Implementing a Successful Handoff Program for Hospitalists: Lessons learned from the SHM-IPASS Mentored Implementation Program Cohort 2  
Society for Hospital Medicine Annual Meeting
- 2017 Patient and Family Centered I-PASS: Improved Communication and Safety  
Pediatric Hospital Medicine 2017
- 2018 Mentored Implementation of the I-PASS Handoff Program in Diverse Clinical Environments  
(Plenary Research Abstract)  
Society for Hospital Medicine Annual Meeting
- 2018 Beyond End of Shift Handoffs: Adapting and Implementing Handoff Improvement Programs Across a Variety of Clinical Settings  
Society for Hospital Medicine Annual Meeting
- 2018 Patient Safety Organization Webinar: Handoffs and Transitions of Care  
North Carolina Quality Center
- 2018 Setting Your Agenda For Safety: Improving Handoffs, Embracing Pharmacogenomics, and Maximizing Your Current Program  
American Society of Health-System Pharmacists

**Awards:**

<u>Year</u>	<u>Name of Honor/Prize</u>	<u>Awarding Organization</u>	<u>Achievement for Which Awarded</u>
2017	John M. Eisenberg Award for National Level Innovation in Patient Safety and Quality	National Quality Forum/ Joint Commission	Research, I-PASS Study
2017	Huesped de Honor/Guest Of the City Honorary Diploma	Legislature of the City of Buenos Aires, Argentina	Leadership of Patient Safety
2018	Top Research Platform Presentation (#1)	Academic Pediatric Association Region I Annual Meeting	Research
2018	Best of Research & Innovations Plenary (top 3 of 1540 submissions)	Society for Hospital Medicine Annual Meeting	Research
2018	Top 3 Patient Safety Innovation Award	Patient Safety Movement Foundation	Innovation

## References

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