

# Improving Patient Handoffs and Transitions through Adaptation and Implementation of I-PASS Across Multiple Handoff Settings

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## Abstract

**Introduction:** Communication failures are common root causes of serious medical errors. Standardized, structured handoffs improve communication and patient safety. I-PASS is a handoff program that decreases medical errors and preventable patient harm. The I-PASS mnemonic is defined as illness severity, patient information, action list, situational awareness and contingency plans, and synthesis by receiver. I-PASS was validated for physician handoffs, yet has the potential for broader application. The objectives of this quality improvement initiative were to adapt and implement I-PASS to handoff contexts throughout a pediatric hospital, including those with little or no known evidence of using I-PASS. **Methods:** We adapted and implemented I-PASS for inpatient nursing bedside report, physician handoff, and imaging/procedures handoff. Throughout the initiative, end-user stakeholders participated as team members and informed the adaptation of the I-PASS mnemonic, handoff processes, written handoff documents, and performance evaluation methods. Peers observed handoffs, scored performance, and provided formative feedback. Adherence to I-PASS was the primary outcome. We also evaluated changes in handoff-related error frequency and clinician attitudes about the effects of I-PASS on personal and overall handoff performance. **Results:** All 5 elements of the I-PASS mnemonic were used in 87% of inpatient nursing, 76% of physician, and 89% of imaging/procedures handoffs. Inpatient nurses reported reductions in handoff-related errors following I-PASS implementation. Clinicians across most handoff settings reported that using I-PASS improved both general and personal handoff performance. **Conclusions:** I-PASS is adaptable to many handoff settings, which expands its potential to improve patient safety. Clinicians reported reductions in errors and improvements in handoff performance. We identified broad institutional support, customized written handoff documents, and peer observations with feedback as crucial factors in sustaining I-PASS usage. (*Pediatr Qual Saf* 2020;4:e323; doi: 10.1097/pq9.0000000000000323; Published online 23 July, 2020.)

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## INTRODUCTION

While controversy exists regarding the number of patient deaths that result from medical errors annually,<sup>1,2</sup> experts agree this is a significant problem in health-care.<sup>3,4</sup> The Joint Commission reported communication failures as the root cause of most sentinel events.<sup>5</sup> Approximately half of these communication failures occur during patient handoffs, which are pervasive in current healthcare systems. Studies in teaching hospitals have documented 4,000 patient handoffs per day.<sup>6</sup> Clinicians across all disciplines regularly participate in some form of patient handoff or transition of care. Effective handoff communication skills need to be systematically taught, but few clinicians receive formal handoff education during training.<sup>7</sup>

Structured patient handoff processes can improve the fidelity of communication. Earlier studies showed that training clinicians to provide structured patient handoffs increased clinician comfort and patient information retention.<sup>8</sup> More recently, a landmark paper by Starmer et al<sup>9</sup> reported improvements in patient safety through handoff standardization. Their study used rigorous

methodology to demonstrate that the use of a structured handoff communication program, I-PASS, led to a 23% reduction in medical errors and a 30% reduction in preventable adverse events (AEs) among residents physicians at 9 pediatric hospitals.<sup>9</sup>

I-PASS is a comprehensive handoff program that trains clinicians to exchange and synthesize relevant patient information concisely. I-PASS aims to help clinicians develop a shared mental model of each patient so that every clinician involved in the patient's care can make decisions aligned with overall goals. Starmer et al<sup>10</sup> described the I-PASS program curriculum that used successful tactics to address cultures that are resistant to change. Central to the I-PASS program is its mnemonic, which represents 5 components of quality patient handoff: illness severity (I), patient summary (P), action list (A), situational awareness and contingency plans (S), and synthesis by the receiver (S).<sup>11</sup>

In consideration of our hospital's patient safety events, patient safety culture survey results, and focus group feedback, standardizing patient handoffs was identified as an institutional improvement priority. We selected the I-PASS program because of the strong evidence that its use reduces errors<sup>9</sup> and the emerging evidence that I-PASS can be adapted broadly across handoff contexts.<sup>12-15</sup> Herein, we describe our quality improvement (QI) initiative to adapt, implement, and sustain I-PASS for handoff communication across various contexts at a pediatric teaching hospital. For each handoff context involved, the initial goal was that within 6 months of implementing I-PASS, 75% of handoffs would use all 5 I-PASS components.

## METHODS

### *Setting and Participants*

St. Jude Children's Research Hospital (St. Jude) is an 80-bed pediatric hospital with integrated outpatient clinics offering subspecialty and surgical services for children with cancer, blood disorders, and other catastrophic diseases. St. Jude sees  $\approx 7,500$  patients in  $\approx 3,500$  inpatient admissions and  $\approx 75,000$  outpatient visits per year. Most patients require ongoing treatment in inpatient and outpatient settings for complex medical diagnoses. Once accepted, patients receive nearly all their care at St. Jude. Patient care teams are often large and multidisciplinary. A single patient may be cared for in the inpatient and outpatient settings over several months to years, with ongoing consultations with specialists as needed. These factors amplify the need for frequent, effective handoff communications to provide and coordinate the delivery of complex care for prolonged periods.

We selected 3 handoff contexts for this QI initiative: evening shift to shift physician signout, morning and evening inpatient nursing bedside report, and handoffs when admitted patients were temporarily transferred to the diagnostic imaging or procedures departments. Oncology fellows and hospitalists primarily conducted physician

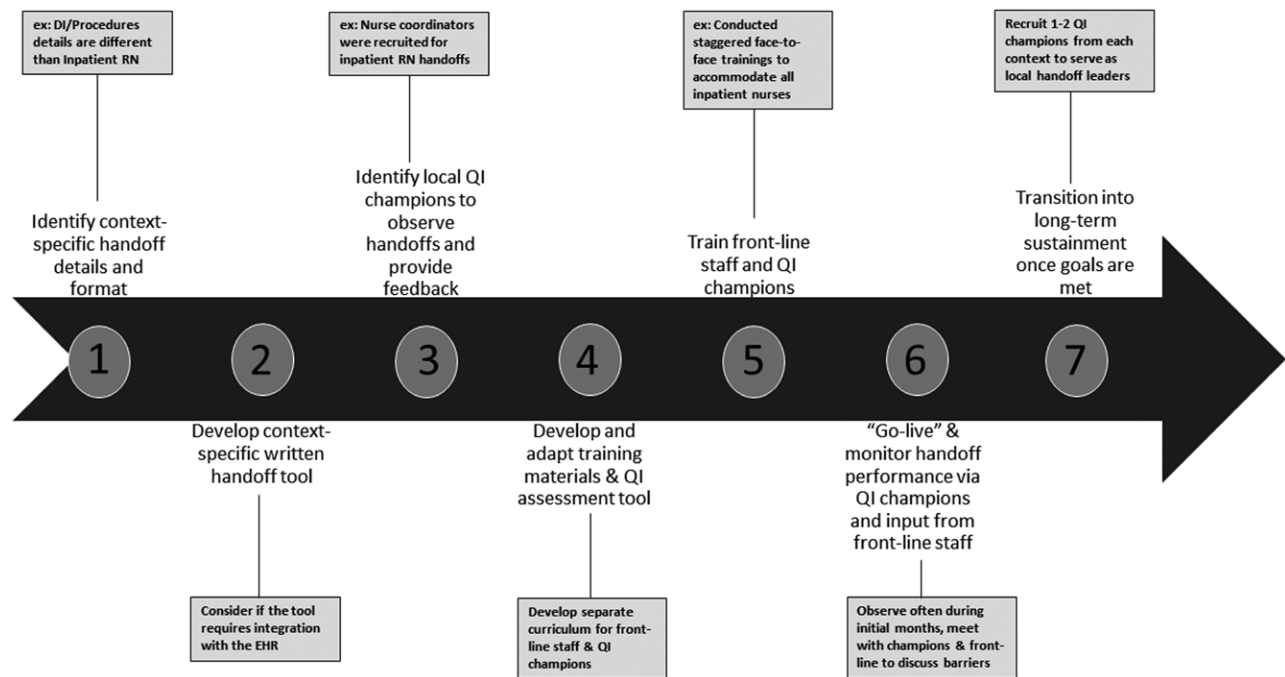
signout. Registered nurses who work in inpatient settings conducted bedside reports, and the imaging/procedures handoffs were conducted among inpatient nurses communicating with diagnostic technologists or ambulatory nurses in the procedures department. The project was approved by the St. Jude institutional review board and supported by clinical leaders at all levels.

### *Project Design*

We conducted a phased implementation of the I-PASS handoff program from 2017 to 2019. Figure 1 illustrates the broad approach to I-PASS implementation. First, clinical handoff contexts were evaluated and prioritized in consideration of the frequency of handoff, handoff complexity, and adaptability to I-PASS. Clinician team members from each circumstance helped determine lists of clinical details necessary for handoffs. These clinicians then advised the development of a customized written handoff tool for each context (see Figure 1, Supplemental Digital Content, which displays written I-PASS formatted handoff tools for (in order from top to bottom): nursing shift report, MD evening signout report, and imaging/procedures handoffs, <http://links.lww.com/PQ9/A195>). Volunteers served as I-PASS QI champions who were responsible for observing handoffs and providing formative feedback. Subsequent steps of I-PASS implementation included the development of context-specific training materials, adapting training formats across settings, and revising QI assessment tools necessary for monitoring performance. After training QI champions and frontline staff, QI data submitted by champions were carefully monitored during initial months, and frequent meetings with staff occurred to discuss progress and identify barriers. Review of QI data and discussions with staff informed interventions to address barriers, which were implemented as ramped Plan Do Study Act cycles.

### *Development of Written Handoff Tools*

Although I-PASS is more than a mnemonic, using the mnemonic consistently is critical to maintaining the structure and enabling high-fidelity information transfer. Verbal handoff quality can be improved by using a coordinated written handoff tool.<sup>16,17</sup> Written tools that integrate with the electronic health record (EHR) can further improve handoffs.<sup>18,19</sup> For each handoff context, clinician team members partnered with project leaders to develop written handoff tools that accommodated all relevant patient information, provided adequate space for note-taking, and were formatted for I-PASS use. For inpatient nursing and physician shift change handoffs, we developed and integrated tools within the hospital's EHR, prepopulating portions of clinical data needed for the handoff. The written tool for imaging/procedures handoffs did not require integration with the EHR. These handoffs are less frequent than those at shift change, and fewer details are exchanged.



**Fig. 1.** The 7 general steps used to implement I-PASS across clinical contexts. Clinicians in each area assisted in each step of implementation, including adapting the mnemonic as needed, developing of the written handoff tool and QI assessment tool, and monitoring performance through direct observations and feedback.

### Education and Training

I-PASS implementation in each clinical context included tailored training based on the previously reported I-PASS handoff bundle.<sup>10</sup> All clinicians within a given context received training before implementing the I-PASS program. I-PASS training was incorporated into new employee orientation to support sustained use. QI champion observers from each clinical situation received separate training focused on fundamental principles of delivering actionable and meaningful feedback. Physician observers were eligible for the American Board of Pediatrics Maintenance of Certification Part 4 credit.

### Phased Implementation

We prioritized the handoff at inpatient nursing shift change first as it affects many patients. There is some evidence to support the use of I-PASS in this context.<sup>12</sup> Moreover, I-PASS implementation had broad support among nursing leadership. We subsequently targeted physician handoffs for similar reasons. Although diagnostic imaging/procedures handoffs affected fewer patients than the other contexts, we selected it because the clinicians involved in these contexts identified the need for improved handoff communication. I-PASS's core components were an intuitive match, while no evidence of successful adaptation of I-PASS to imaging/procedures exists. I-PASS implementation has been sustained in these 2 contexts (Table 1) and is expanding to other hospital areas, including novel staff backgrounds such as among respiratory therapists. (See Table 1, Supplemental Digital Content, which provides description of additional handoff contexts in various

stages of I-PASS handoff program implementation, <http://links.lww.com/PQ9/A195>.)

### Measures

We tracked project performance via observed adherence to the I-PASS model, perceptions of handoff errors, and self-reported change in overall and personal handoff performance following I-PASS implementation.

### I-PASS Process Adherence

We selected adherence to the I-PASS mnemonic as the primary outcome measure, treating adherence to a validated method as a proxy for improved patient safety outcomes. We defined adherence as the utilization of each of the 5 components of the I-PASS mnemonic. We evaluated adherence through direct observation,<sup>20-22</sup> in which a third clinician observed patient handoffs, either in-person or by phone (see Figures 2 and 3, Supplemental Digital Content, which displays model of handoff interaction, direct observation, and provision of formative feedback during physician evening handoff between a daytime fellow and overnight clinician. A peer or supervisor observes handoff, then provides feedback to the handoff giver and receiver, <http://links.lww.com/PQ9/A195>; model of handoff interaction, direct observation, and provision of formative feedback during handoff between an inpatient nurse and diagnostic imaging technologist. Left, Receiver-driven handoff occurring via speakerphone between a diagnostic imaging technologist and an inpatient nurse, while another technologist observes. Right, The observer providing formative feedback to the diagnostic imaging

Table 1. Description of 3 Handoff Contexts in Sustainment after Successful I-PASS Handoff Implementation

Handoff Type	Purpose	Handoff Roles	Observer	Adaptation
Inpatient nursing shift change handoff	Safely transition patient care from outgoing to incoming bedside nurse at change of shift	<i>Giver:</i> outgoing inpatient nurse <i>Receiver:</i> incoming inpatient nurse	Nursing colleague or charge nurse	Process adapted to bedside reporting, written handoff tool created by local IT department that extracts relevant information from the EHR, charge nurses played the role of direct observer and offered formative feedback after handoff is concluded. Observations were written into charge nurse job responsibilities.
Physician evening handoff	Transition care from daytime service fellow to overnight coverage provider	<i>Giver:</i> daytime service fellow <i>Receiver:</i> overnight coverage provider (fellow, hospitalist, resident)	Physicians, APPs, and patient safety team members	Written handoff tool created by local IT department that extracts relevant information from the EHR, physician observers had potential to earn maintenance of certification credit, feedback delivered from observers after conclusion of one service/department's signouts (~10–15 patients).
Imaging/procedures handoff	Facilitate communication between inpatient bedside nurse and diagnostic imaging or procedures clinician when admitted patients are traveling within the hospital	<i>Giver:</i> inpatient bedside nurse <i>Receiver:</i> diagnostic imaging technician, procedures nurse, or sedation nurse	Receiver's colleague	Process adapted to allow the receiving party to drive the conversation and streamline information specific to the service to be delivered (eg for an x-ray or CT scan), customized written handoff tool independent of EHR (ie, a blank printed pdf file), peer observations conducted by a volunteer group of immediate peers.

technologist, <http://links.lww.com/PQ9/A195>). After observing a handoff, I-PASS observers provided 2 specific and actionable feedback statements: one reinforcing a witnessed best practice and one addressing an opportunity for improvement. Observed adherence to each of the 5 I-PASS mnemonic components was documented on an assessment tool developed by the project team and submitted to the patient safety group for inclusion in data analysis. We communicated target adherence to the I-PASS mnemonic through specific and time-based goals that were decided through discussions with end-users. For each context, the initial goal was to reach 75% adherence by 6 months of post-go-live implementation.

### Perceived Handoff Errors

Project team members with expertise in survey development created a questionnaire to assess the impact of I-PASS implementation on inpatient nursing-perceived handoff errors (see Table 2, Supplemental Digital Content, which displays perceived handoff error and handoff performance improvement items <http://links.lww.com/PQ9/A195>). Approximately 3 hours into a nursing shift, team members approached nurses at random to verbally administer the questionnaire. We asked nurses whether they observed mistakes or omissions in their current shift bedside report. An affirmative answer triggered a request to list mistakes individually. These were counted and used to calculate error rates. Inpatient nurses were sampled equally across all shifts and departments. Data were collected once before I-PASS implementation and thrice postimplementation, approximately 8 weeks apart.

### Perceived Handoff Improvement

Our hospital annually evaluates patient safety culture via a self-reported survey, and all clinical providers are invited to complete it. The routine St. Jude 2018 Patient Safety Culture Survey included questions to assess perceptions

of I-PASS (see Table 2, Supplemental Digital Content, which displays perceived handoff error and handoff performance improvement items, <http://links.lww.com/PQ9/A195>). Staff members from departments implementing I-PASS (1) rated the change in overall handoff performance since implementation and (2) recalled and compared their handoff effectiveness before and after using I-PASS.

### Statistical Analyses

We analyzed adherence to I-PASS by statistical process control (SPC) charts (p-charts) created with SPC for Excel (version 5.0.1.6, Cypress, TX). We followed established rules for identifying special cause variation.<sup>23</sup>

We analyzed pre- and postimplementation differences in nursing-perceived handoff errors by a 1-way repeated measures analysis of variance (SPSS version 24, Chicago, Ill.).

We used descriptive statistics to report respondent perceptions of global and personal handoff performance changes related to I-PASS implementation. We compared the mean pre- and post-I-PASS personal handoff effectiveness perceptions with paired samples *t* tests.

## RESULTS

### Adherence to I-PASS Mnemonics

Figures 2–4 are SPC charts that display I-PASS mnemonic adherence rates for each clinical context. For all 3 handoff contexts, the initial adherence goal of 75% during the first 6 months of implementation was revised to 90% during the third month due to strong performance. It remained at 90% for the remainder of the project. Goal revisions were decided through discussions with end-users and local handoff department leaders. When performance dropped to levels to indicate special cause, discussions of barriers occurred with end-user stakeholders. For

inpatient nursing and imaging/procedures, adherence to all 5 I-PASS components was strong and consistent (mean = 87% and 89%, for inpatient nursing and imaging/procedures, respectively). Physician evening handoff performance was more variable and had a mean adherence of 76% over the study period. However, special cause rules dictated a centerline shift for physician handoff performance, with an initial mean of 73% increasing to 89% for the period after the shift.

**Perceived Handoff Errors**

Before implementing I-PASS, the mean number of perceived handoff errors per handoff encounter for inpatient nursing was 0.42 errors per handoff. At 8, 16, and 24 weeks postimplementation, the mean number of perceived errors decreased to 0.06, 0.19, and 0.13, respectively. Post I-PASS implementation error rates were significantly lower ( $P < 0.05$ ).

**Patient Safety Culture Survey Results**

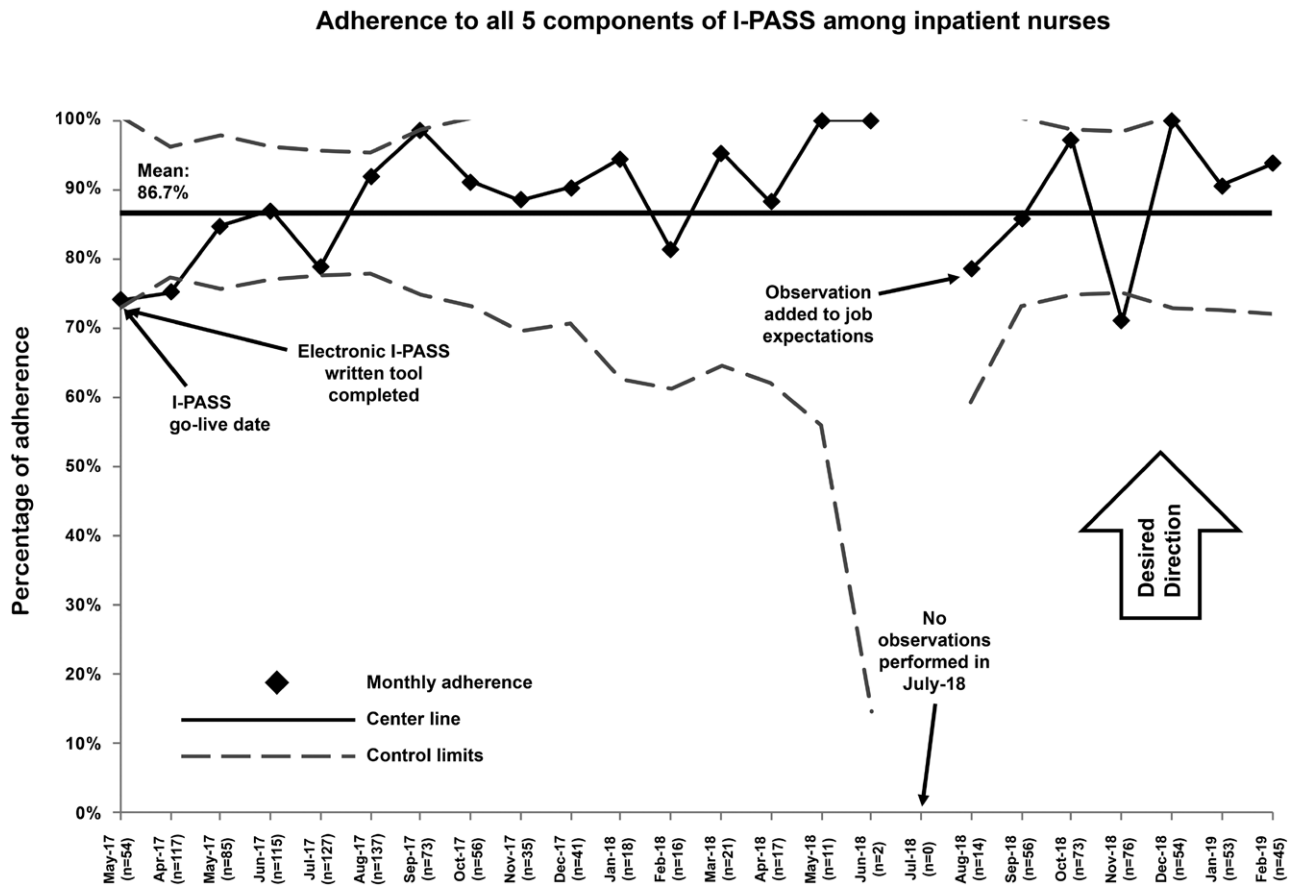
The 2018 Patient Safety Culture Survey yielded an overall response rate of 69%. Seventy-five percent of inpatient nurses, 80% of physicians, 94% of diagnostic imaging technologists, and 46% of procedures nurses reported

that I-PASS improved or greatly improved overall handoff quality (Table 2).

Regarding perceived changes in personal handoff effectiveness, 51% of inpatient nurses, 27% of physicians, 87% of diagnostic imaging technologists, and 37% of procedures nurses reported improvement after I-PASS implementation (Table 2). Paired samples *t* tests comparing means of personal perceptions of handoff effectiveness pre- and post-I-PASS revealed statistically significant improvements for inpatient nurses, physicians, and diagnostic imaging technologists ( $P < 0.001$ ). Results were not significant for procedural nurses

**DISCUSSION**

The lack of standardized handoff processes in our hospital limited our ability to provide safe and high-quality patient care. Although existing policies mandated that handoffs should occur, handoff processes and performance varied across and within clinical contexts. To improve handoff communication, we identified a well-established structured process, then adapted it to handoff settings across our hospital.



**Fig. 2.** Percentage of inpatient nursing shift change handoffs that used all 5 components of I-PASS. Of note, an electronic I-PASS-formatted handoff tool was active at the initiation of this implementation. No observations occurred in July of 2018 due to the relaxed expectation of continued data collection as a result of consistent performance.

Adherence to all 5 components of I-PASS among physicians and advanced practice providers

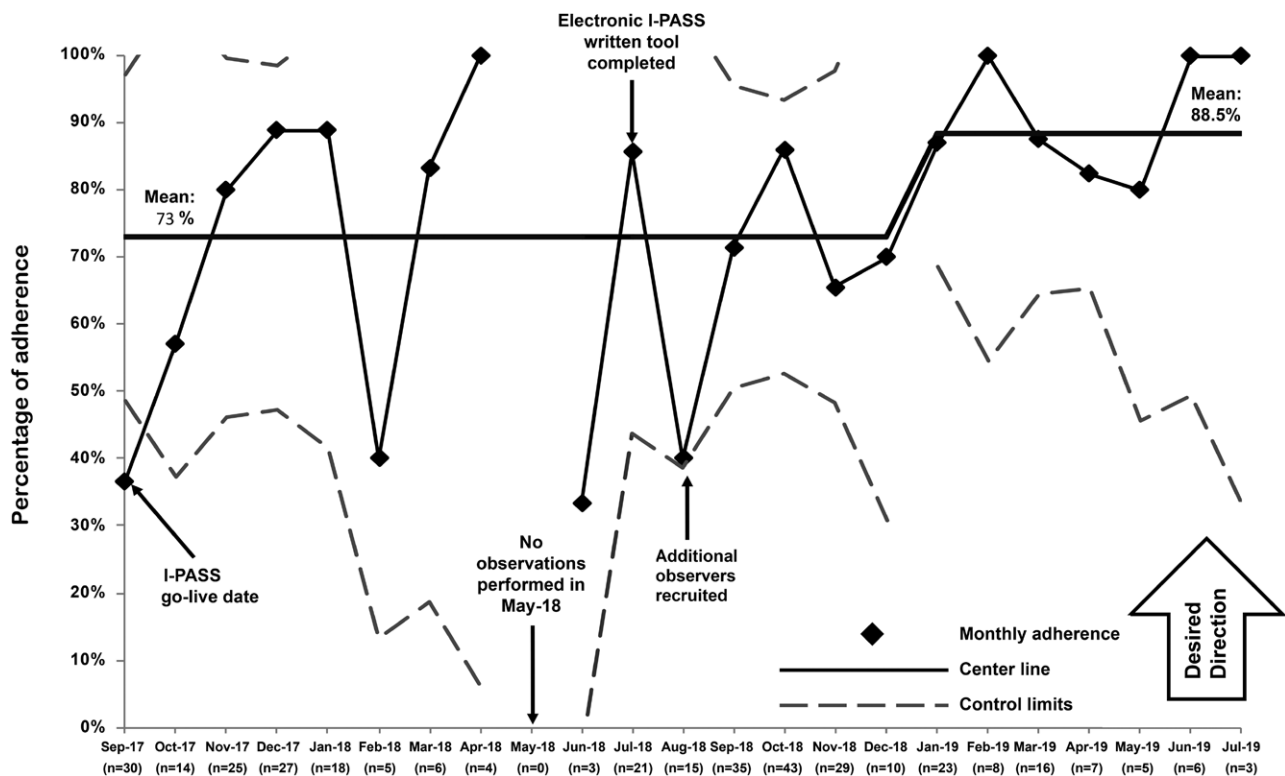


Fig. 3. Percentage of physician handoffs that used all 5 components of I-PASS. Of note, the electronic I-PASS formatted handoff tool was not active until 10 months into implementation. No observations were conducted in May of 2018 because no peers volunteered to participate during this month. Data from August of 2018 were excluded from control chart analyses because only physicians not trained to use I-PASS (ie, attending physicians) were observed during this month.

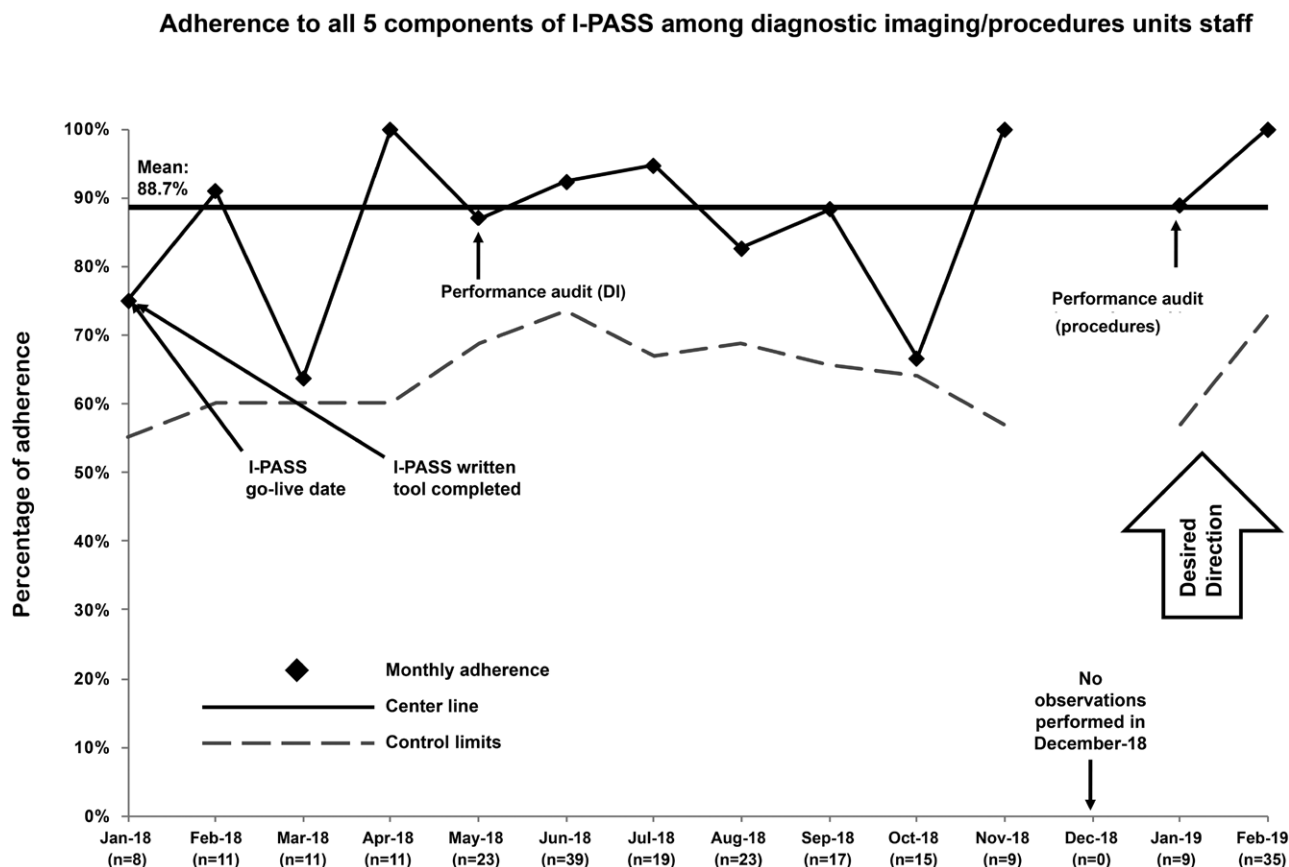
The I-PASS program was selected as it has strong evidence supporting its ability to improve patient safety.<sup>9,14,20,24</sup> Chief among previous research is a multisite study by Starmer et al.<sup>9</sup> One compelling aspect of their research was its rigorous methodology, which used extensive resources to attribute reduced errors and AEs to I-PASS use affirmatively. While I-PASS was developed for resident physician handoffs, we presumed that the core elements of I-PASS could be maintained across many handoff contexts and disciplines. Our efforts demonstrate support for I-PASS’s broad applicability, as we successfully adapted the model to previously unexplored handoff contexts. Across all areas, mean adherence rates to using all five components of the I-PASS mnemonic were 76%–89%, exceeding those previously reported.<sup>9,20,21</sup> Further, perceived handoff error rates decreased for inpatient nurses, overall perceptions of handoff performance increased across all disciplines studied, and most respondents reported increases in personal handoff performance.

We identified 3 fundamental factors for successful I-PASS adaptation, implementation, and sustained use. These factors are broad institutional support and commitment, custom-written handoff tools for each handoff setting that incorporates I-PASS formatting, and ongoing use of direct observations with

formative feedback. Our hospital designated this project as an annual institutional improvement priority in the planning stages, which engendered organizational support, resources, institution-wide visibility, and accountability.

While top-down support was pivotal, end-user stakeholders were involved in the project’s earliest conceptual stages and remain involved in our efforts to sustain and expand the use of I-PASS. Mainly, we knew that sustained use of I-PASS required absolute buy-in from end-users, and we made earnest efforts to be deferential to their expertise. We sought and integrated their feedback through each aspect of the project, including written tool development, handoff process refinement, the format of direct observation methods, and the development of project performance assessment methods. We intended to build strong relationships, where honest and open communication would serve to anticipate and overcome barriers. While somewhat speculative, we feel that our partnerships with end-user stakeholders were fundamental in achieving rapid and sustained use of I-PASS.

Although written handoff tools existed in most areas, many were outdated, and none followed the I-PASS format. We customized I-PASS handoff tools for each setting by acknowledging the variability in the extent and detail



**Fig. 4.** Percentage of imaging/procedures handoffs that used all 5 components of I-PASS. Of note, the non-EHR enabled I-PASS-formatted handoff tool was active at the initiation of this implementation. No observations occurred in July of 2018 due to the relaxed expectation of continued data collection as a result of consistent performance.

**TABLE 2. Impact of I-PASS Handoff Program on Overall and Personal Handoff Quality**

Role	Greatly Decreased or Decreased	Stayed the Same	Improved or Greatly Improved
<b>Perceived change in overall handoff quality due to I-PASS implementation</b>			
Inpatient nurses (n = 180)	6 (3%)	41 (23%)	133 (74%)
Physicians (n = 15)	0	3 (20%)	12 (80%)
Diagnostic imaging technologists (n = 15)	0	1 (7%)	14 (93%)
Sedation or procedures nurses (n = 24)	1 (4%)	12 (50%)	11 (46%)
<b>Perceived change in personal handoff effectiveness before and after I-PASS implementation</b>			
Inpatient nurses (n = 180)	11 (6%)	78 (43%)	91 (51%)*
Physicians (n = 15)	0	11 (73%)	4 (27%)*
Diagnostic imaging technologists (n = 15)	0	2 (13%)	13 (87%)*
Sedation or procedures nurses (n = 24)	4 (17%)	12 (50%)	8 (33%)

\*P < 0.05.

of information exchanged across handoff settings. While we were able to build EHR-enabled tools for some hand-off settings, tools with these features were not required for success across all settings. Substantial resources are needed to create a custom electronic tool, and this can be a limiting factor. For less complicated handoffs, written I-PASS templates were made using word processing software, printed blank, and completed by hand. This approach was sufficient for handoffs when patients traveled from the inpatient units for diagnostic imaging or other procedures. An advantage of using nonelectronic written tools is that they can be modified without

requesting informatics resources, which allows for rapid improvement cycles and optimization.

Physician adherence to the I-PASS mnemonic illustrates the importance of using a written handoff tool that incorporates I-PASS formatting.<sup>20</sup> At the initiation of our project, physician I-PASS adherence increased from ≈40% to ≈90% in 4 months (Fig. 4). However, this initial momentum was not sustained. Feedback from physicians indicated a lack of an I-PASS formatted written tool as a root cause. Physicians reported that it was cognitively burdensome to consistently follow I-PASS verbally when the written tool was not concordant. Adherence improved

and was sustained (ie, substantiating an upward shift in the centerline) after introducing the physician I-PASS written handoff tool.

Direct observation, coupled with immediate formative feedback, was also critical to this project. Handoff performance has been monitored through direct observation in previous handoff research.<sup>9,12,20-22,26</sup> Our QI champion volunteers received training that focused on delivering constructive and actionable feedback to enhance individual handoff performance continually. Additionally, regular observation and feedback signals to clinicians that handoff communication is an essential clinical skill worth mastering. However, direct observation has limitations, that is, the potential for the Hawthorne effect.<sup>26</sup>

Successful adaptation of I-PASS for imaging/procedures handoffs was perhaps the most novel component of our project. For this context, we developed a receiver-driven approach to I-PASS. It allowed clinicians to receive the patient from the inpatient unit to obtain relevant details from the patient's bedside nurse efficiently. This receiver-driven approach has been used previously in the emergency department<sup>25</sup> and seemed well-suited to scenarios wherein receiving clinicians need targeted information from providing clinicians with more robust knowledge of the patient. In this handoff context, we also learned to be flexible with the direct observation process. At the suggestion of diagnostic imaging technologists, we developed a new observation model wherein a colleague in the immediate clinical area observes the handoff occurring by phone (see Figure 3, Supplemental Digital Content, which displays model of handoff interaction, direct observation, and provision of formative feedback during handoff between an inpatient nurse and diagnostic imaging technologist. The panel on the left demonstrates receiver-driven handoff occurring via speakerphone between a diagnostic imaging technologist and an inpatient nurse, while another technologist observes. The panel on the right illustrates the observer providing formative feedback to the diagnostic imaging technologist, <http://links.lww.com/PQ9/A195>).

The adaptability of the I-PASS program demonstrated at our institution suggests that we can accommodate many, if not all, types of patient handoffs within the I-PASS model. Currently, efforts are being made to adapt and expand I-PASS to admissions from outpatient clinics, among respiratory therapists, during overnight rounds, postoperative admissions, and more (see Table 1, Supplemental Digital Content, which displays description of additional handoff contexts in various stages of I-PASS handoff program implementation, <http://links.lww.com/PQ9/A195>).

This QI initiative has its limitations. While we achieved consistent adherence and positive staff perceptions of I-PASS, we could not link handoff improvements to rates of AEs. Rigorously designed, multisite research validated the hypothesis that utilization of I-PASS would reduce errors and preventable patient harm.<sup>9</sup> Replicating this methodology for a QI project was impractical given the

resources required. Therefore, we can only infer that we experienced similar improvements in patient safety by following a previously validated best practice. Also, our hospital had many co-occurring efforts to reduce errors and preventable AE's, so attributing I-PASS use to changes in these rates would have been speculative. Experimental design methods could surmount this limitation and should be used in I-PASS research. Second, our project did not include a baseline period for tracking performance across all settings. Since previous research has validated I-PASS as an intervention to improve patient safety, we did not collect baseline handoff performance data outside of inpatient nurse perceptions of handoff-related errors pre- and postimplementation of I-PASS.<sup>9</sup> After analyzing the inpatient nursing perception of error data, which demonstrated improvements, we decided to dedicate project resources to other aspects of the initiative (eg, collecting direct observation data and delivering formative feedback) for subsequent implementation areas. Finally, our hospital's unique patient population and care model may limit our project's generalizability. Other settings that have patients with more diverse illnesses should consider this difference across settings as they adopt and implement I-PASS.

## CONCLUDING SUMMARY

The I-PASS handoff program is flexible and adaptable across numerous clinical contexts. We identified early engagement of end-user stakeholders, broad institutional support, customized written handoff documents, and ongoing observation and feedback as critical factors in the successful adaptation, implementation, and sustained use of I-PASS.

## DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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