Invited Commentary

Standardized Handoffs in the Intensive Care Unit
Hope or Hype for Improving Critical Care?

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Transitions in patient care do not occur without negative consequences. We have known for more than 20 years that a cross-covering physician dramatically increases the risk of preventable adverse events.[1] The 2003 implementation of duty hour restrictions increased the number of handoffs required for care of inpatients; these changes also led many to question whether duty hour restrictions were a benefit or detriment to patient safety, with both medicine and surgery residents indicating that patient harm commonly resulted from handoffs.[2] No place is there more potential for patient harm resulting from handoffs than the intensive care unit (ICU), owing to patients' severity of illness and the resulting complexity of this patient population.

Related article

Previous work[3] has demonstrated the efficacy of the I-PASS (illness severity, patient summary, action list, situation awareness and contingency plans, and synthesis by receiver) program in decreasing the medical error rate and preventable adverse events without affecting the sign-out duration or resident workflow. In this issue of *JAMA Surgery*, Parent et al[4] explicitly examine the effect of the UW I-PASS program on perceptions of adequacy of interstaff communication in the ICU setting. Their findings indicate a subjective strongly positive sense by physicians and advanced practice clinicians that participation in the I-PASS curriculum improved team communication and patient safety. However, the objective outcome data show no improvement in ICU length of stay, ventilator days, or reintubation rates.

The authors acknowledge the importance of demonstrating improved clinical outcomes as the gold standard for any care process intervention like I-PASS. Their contrasting findings beg the question of measurable benefits of a standardized handoff system on patient care in the ICU. Was the basis of no measurable benefit on clinical outcomes in this study truly because of smaller sample size and an existing high-quality care system? Or was the absence of improved clinical outcomes a result of the ICU system mandating a different structure for transitions of care because of patient complexity? The I-PASS program may indeed prove useful for improving physician communication and therefore is likely to benefit interactions in new ICUs or within ad hoc patient care teams in the ICU. Broader evaluation in more ICU environments is required before we can fully understand the effect of the I-PASS program or other tools for standardized handoffs on patient safety in the ICU.

ARTICLE INFORMATION

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JAMA Surgery | Original Investigation

Effect of Standardized Handoff Curriculum on Improved Clinician Preparedness in the Intensive Care Unit
A Stepped-Wedge Cluster Randomized Clinical Trial

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IMPORTANCE Clinician miscommunication contributes to an estimated 250 000 deaths in US hospitals per year. Efforts to standardize handoff communication may reduce errors and improve patient safety.

OBJECTIVE To determine the effect of a standardized handoff curriculum, UW-IPASS, on interclinician communication and patient outcomes.

DESIGN, SETTING, AND PARTICIPANTS This cluster randomized stepped-wedge randomized clinical trial was conducted from October 2015 to May 2016 at 8 medical and surgical intensive care units at 2 hospital systems within an academic tertiary referral center. Participants included residents, fellows, advance-practice clinicians, and attending physicians (n = 106 clinicians, with 1488 handoff events over 8 months) and data were collected from daily text message–based surveys and patient medical records.

EXPOSURES The UW-IPASS standardized handoff curriculum

MAIN OUTCOMES AND MEASURES The primary aim was to assess the effect of the UW-IPASS handoff curriculum on perceived adequacy of interclinician communication. Patient days of mechanical ventilation, intensive care unit length of stay, reintubations within 24 hours, and order workflow patterns were also analyzed. Mixed-effects logistic regression was used to compute odds ratios and confidence intervals with adjustment for location, time period, and clinician.

RESULTS A total of 63 residents and advance practice clinicians, 13 fellows, and 30 attending physicians participated in the study. During the control period, clinicians reported being unprepared for their shift because of a poor-quality handoff in 35 of 343 handoffs (10.2%), while UW-IPASS–period residents reported being unprepared in 53 of 740 handoffs (7.2%) (odds ratio, 0.19; 95% CI, 0.03-0.74; $P = .03$). Compared with the control phase, the perceived duration of handoffs among clinicians using UW-IPASS was unchanged (+5.5 minutes; 95% CI, 0.34-9.39; $P = .30$). Early morning order entry decreased from 106 per 100 patient-days in the control phase to 78 per 100 patient-days in the intervention period (−28 orders; 95% CI, −55 to −4; $P = .04$). Overall, UW-IPASS was not associated with any changes in intensive care unit length of stay, duration of mechanical ventilation, or the number of reintubations.

CONCLUSIONS AND RELEVANCE The UW-IPASS standardized handoff curriculum was perceived to improve intensive care provider preparedness and workflow. IPASS-based curricula represent an important step forward in communication standardization efforts and may help reduce communication errors and omissions.

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Supplemental content

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Every year, clinician miscommunication contributes to approximately one-third of serious inpatient medical errors,[1] resulting in an estimated 250 000 preventable deaths annually in US hospitals.[2,3] Handoffs during transitions of care represent a significant proportion of interclinician communication and are particularly susceptible to error.[4] The Joint Commission and the Accreditation Council for Graduate Medical Education have identified handoff communication as a key target for national quality improvement and patient safety efforts.[4-6] Despite this, to our knowledge, few attempts have been made to standardize handoff communication in an evidence-based manner.[7-9]

Standardization and improvement of handoff practices are particularly crucial in an academic environment.[5] At teaching hospitals, resident physicians often "cross cover," serving as temporary clinicians for patients. This commonly occurs overnight when staff support and direct senior supervision may be diminished. Covering residents may have only fragmented knowledge of patients and therefore rely heavily on clear, concise, and directed handoff from the previous clinician.[10] Moreover, resident work hour restrictions have led to more frequent handoff communications and thus could increase the occasions for inaccuracies or omissions.[11]

The UW-IPASS handoff curriculum was developed by a resident-led team as part of a quality improvement project to address handoff communication inadequacy at a multisite academic institution. Details of the curriculum design and implementation are described in another article.[12] Briefly, the intent of UW-IPASS is to standardize and improve clinician handoffs in adult intensive care units (ICUs), mainly through the use of a mnemonic and an electronic medical record (EMR) tool that ensures communication of essential information (**Figure 1**). This tool was systematically implemented via a teaching curriculum in 8 ICUs with the help of onsite leaders, who provided evaluations of program compliance and gave clinician feedback. This mnemonic was adapted with permission from the original IPASS curriculum, which was designed for use with acute care pediatric patients.[7] In a pediatric inpatient population, implementation of the IPASS curriculum led to a 23% relative decrease in medical errors and a 30% relative decrease in adverse events.[5]

In this cluster randomized stepped-wedge clinical trial of 8 adult ICUs in 2 tertiary teaching hospitals, the primary aim was to assess the effect of the UW-IPASS handoff curriculum on perceived adequacy of interclinician communication. Secondary aims included assessing the effect of UW-IPASS with length of stay (LOS), days of mechanical ventilation, reintubation within 24 hours, and order entry workflow patterns.

Key Points

Question Does the UW-IPASS standardized handoff affect clinician communication in the intensive care unit?

Findings In this single-institution cluster randomized stepped-wedge clinical trial, the use of a standardized handoff curriculum resulted in a significant 3% decrease in communication errors, without any change in the duration of the handoff. Seventy-three percent of clinicians reported that participation in the curriculum improved team communication and patient safety.

Meaning The IPASS-based transitions of care represent an important step forward in communication standardization efforts and may help reduce clinician communication errors and omissions.

Figure 1. UW-IPASS Handoff Mnemonic

I	Illness severity	Fair: no major interventions anticipated Watcher: monitoring hourly, with interventions possible Unstable: monitoring at 1/2 hour or less, with interventions likely Discharge/comfort care
P	Patient summary	Age, sex, primary diagnosis, and comorbidities 24-h events Assessment by problem or system: Key topics: Hemodynamic/volume status Ventilator management Tubes/lines/drains Antibiotics Transfusion plan Code status, family contact Key exam findings: neurological, vascular 24-h big-picture plan
A	Action list	Plan for this shift: to do list Who does it and when?
S	Situation awareness and contingency planning	What are anticipated problems in the next 24 h? Plan for anticipated problems: "if/then" statements
S	Synthesis by receiver	Receiver asks questions and restates key issues and action items

Designed for standardized interclinician communication in the adult intensive care unit.

Methods

Study Design, Participants, and Setting

Implementation of the UW-IPASS curriculum was conducted using a cluster randomized stepped-wedge clinical trial that permitted staggered implementation and assessment of this large-scale quality improvement initiative.[13] Eight of 9 surgical and medical ICUs across 2 tertiary care teaching hospitals agreed to randomization. One ICU (a 13-bed medical-cardiac ICU) was excluded because this unit was already using an IPASS-based communication structure. The remaining 8 ICUs were cluster randomized by a study investigator (L.N.L.) to receive the UW-IPASS curriculum in 4 successive waves (2 ICUs per wave), from October 2015 to May 2016 (**Figure 2**).

All clinicians at all locations were required to participate in UW-IPASS education and training, and compliance with the curriculum was tracked and enforced by ICU directors. Noncompliant clinicians received immediate feedback from onsite advocates. In addition, residents, fellows, nurse practitioners (NPs), physician assistants (PAs), and attending physicians were recruited to voluntarily participate in surveys that assessed the perceived utility and acceptability of the UW-IPASS project. For the purposes of analysis, NP, PA, and resident responses were combined because their clinical roles and responsibilities within the ICUs are similar. This study was

approved by the University of Washington Human Subjects Division and written informed consent was provided for all participants. The trial protocol can be found in Supplement 1.

Intervention

The UW-IPASS standardized handoff curriculum was developed via a resident-led quality improvement project, as previously described.[12] The curriculum included 4 essential elements. First, an online module was created to orient clinicians to the UW-IPASS handoff method. Second, the UW-IPASS mnemonic was printed as a pocket card and made available to all ICU clinicians who were participating in handoffs (Figure 1). Third, a computerized UW-IPASS handoff tool was incorporated into our institution's EMR (Cerner Millennium; Cerner Corporation) using an embedded rounding and handoff application (CORES; Transformative Med Inc). Fourth, orientation and support were provided via weekly audio-visual presentations and handoff observations by experienced clinicians.

All ICUs received the intervention and control data were collected from ICUs before curriculum implementation. During this control period, handoff procedures were conducted according to local ICU cultures and individual clinician preference (the prior standard of care).

Outcomes

Clinician Perceptions of Handoffs

Clinician perceptions of handoffs were assessed via multiple methods. Surveys specific to each clinician role were administered to participants in each ICU (eMethods in Supplement 2). From September 2015 until May 2016, a daily "postshift query" was sent to fellows, residents, NPs, and PAs via anonymous, secure, and automated text messaging (Qualtrics Inc). Postshift queries were sent at 8 AM, immediately following the night shift in the ICU of interest. These queries assessed the perception of clinicians of factors directly related to handoff quality in the preceding shift. These factors included communication failures, clinician knowledge of the patient, and plan-of-care consistency and advancement (**Table 1**). All participants were also invited to complete surveys distributed via email at the beginning and end of the intervention period to determine its effect on their attitudes and practices concerning handoffs. Optional free-text descriptions of failures in handoff were analyzed via a deductive content analysis using a codebook developed to identify failures in each of the 5 components of the handoff mnemonic.

Twenty-five brief interviews were conducted with various clinicians (interns, residents, fellows, attending physicians, NPs, and PAs) who worked in 1 of the 8 IPASS ICUs at some point during the study. Two UW-IPASS team members (J.M.Z. and P.T.S.) visited all 8 ICU team rooms and interviewed participants in-person after written informed consent was obtained. Data collection continued until at least 1 interview was conducted with a clinician from each of the 8 ICUs. These interviews were analyzed using a deductive content analysis.[14]

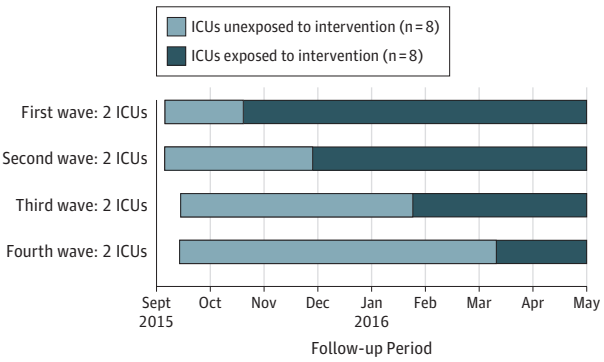
Patient Quality of Care

Aggregate deidentified ICU-quality indicators were also collected to assess the effect of the curriculum on clinical outcomes, including days of mechanical ventilation, ICU LOS, reintubations within 24 hours, and order entry workflow patterns. Daily order entry between 6 AM and 8 AM was specifically examined; orders during this period often represent attempts by the day team to rectify "missed" tasks from overnight before morning rounds (transfer orders and discharge orders were specifically excluded from this analysis). Aggregate data collection was conducted using a common Clinical Data Warehouse (Microsoft Amalga; Microsoft Corp) that was used by both hospitals.

Statistical Analysis and Data Presentation

Categorical data are shown as counts with percentages and continuous data are shown as means with 95% CIs. A sample size of 3240 handoff events was determined to have an 80% power to detect a 10% difference in handoff errors between intervention and control arms, based on prior data related to hand-

Figure 2. Stepped-Wedge Cluster Randomized Implementation of the UW-IPASS Standardized Handoff Curriculum



Conducted in 8 intensive care units (ICUs) over a period of 8 months at 2 tertiary-referral teaching hospitals.

Table 1. Postshift Queries Sent Daily to Residents, NPs, PAs, and Fellows Before and After the Implementation of UW-IPASS

Clinician Type	Queries
Residents/NPs/PAs	Were you unprepared for something during your shift that a better handoff could have prevented? (Yes/No) How long did your handoff take? (estimate in min) Did the overnight clinician fail to appreciate a patient's illness severity due, in part, to poor handoff? (yes/no)
Fellows	Was essential information for patient care, known by the day team, not conveyed to the overnight clinician? (yes/no) Was a plan delineated yesterday not enacted due to miscommunication between ICU team members? (yes/no)

Abbreviations: ICU, intensive care unit; NP, nurse practitioner; PA, physician assistant.

Table 2. Fellows' Evaluations of Night Resident Competency Before and After the Implementation of UW-IPASS[a]

Overnight Clinician	No. (%) Control Survey Responses (n = 224)	No. (%) Intervention Survey Responses (n = 171)	aOR (95% CI)	*P* Value
Failed to appreciate illness severity	7 (3)	4 (2)	0.97 (0.05-17.28)	.98
Did not know essential patient medical history	20 (9)	8 (5)	0.09 (0.001-8.25)	.30
Failed to implement a care plan	31 (14)	18 (11)	0.21 (0.02-2.43)	.21

Abbreviation: aOR, adjusted odds ratio.

[a] Categorical data are presented as No. (%). Statistical significance was assessed using a mixed-effects logistic regression model, with model structure as (1) exposure of interest, UW-IPASS curriculum, (2) outcomes, as listed above, and (3) covariates: intensive care unit location, period, and individual clinician.

off error prevalence.[7] Mixed-effects logistic regression models were used to assess the effect of implementing the UW-IPASS curriculum (the exposure of interest) on clinician responses. These models were used to compute odds ratios (OR) for categorical outcomes or estimated mean differences for continuous outcomes, each with 95% CIs. Additional covariates in these models included categorical variables to allow for clustering by ICU, fixed effects by the period since study initiation, and for random effects by individual clinician. An α level of .05 was assumed for statistical significance. Analyses were performed using the R software environment, version 3.2.4 (R Foundation) with the "lme4" package[15] and Stata, version 12.1 (StataCorp).

Results

Overall, 106 of an estimated 344 eligible participants (31%) agreed to enroll (eFigure in Supplement 2). Participants represented a sample of the workforce for ICUs in this clinical trial and were composed of all different training levels from the departments of surgery, medicine, anesthesia, and emergency medicine. Sixty-three of 247 residents, NPs, and PAs (26%), 13 of 33 fellows (39%), and 30 of 64 attending physicians (47%) agreed to enroll in the study. Residents, NPs, and PAs had 343 handoff events during the control period and 740 handoff events during the intervention period. The fellows had 244 handoff events during the control period and 171 handoff events during the intervention period. During the study period from October 1, 2015, and June 1, 2016, the use of the EMR tool was tracked; this demonstrated that clinicians used the tool 14 964 times of 23 384 potential opportunities for use (64% overall compliance). Over the study period, the use of the EMR tool increased from 56% to 74% compliance per week.

Communication Failures Among Residents, NPs, PAs, and Fellows

During the control period, residents, NPs, and PAs reported being unprepared for their shift because of a poor-quality handoff 35 times (10.2%) of 343 handoffs, while intervention period residents, NPs, and PAs reported being unprepared in 53 of 740 handoffs (7.2%). Compared with the control period, the UW-IPASS intervention was associated with an 80.5% reduction in the odds of a perceived poor handoff among residents, NPs, and PAs within the same ICU and study period (OR, 0.19; 95% CI, 0.03-0.74; *P* = .03).

Additional qualitative data from resident, NP, and PA surveys provided details about perceived communication failures. Forty-four respondents (control, n = 22; intervention, n = 22) included optional free text explanations about the nature of perceived handoff failures. A qualitative analysis showed a similar reported frequency of types of handoff failure between the intervention and control groups. Fifteen respondents (34%) noted an inadequate communication of patient medical histories, 13 respondents (30%) expressed frustration with specific members of the team, and 8 respondents (18%) noted a failure to communicate relevant contingency plans (*P* = .20). Notably, before UW-IPASS implementation, 46 of 63 residents, NPs, and PAs (73.3%) reported that they were "confident" about their handoff communication skills, compared with 58 of 63 (91.5%) after implementation (*P* = .71). Before the intervention, 6 of 13 clinical fellows (45%) estimated that ICU team handoff errors occurred fewer than 5 times per month. After UW-IPASS implementation, all of the fellows estimated that handoff errors occurred fewer than 5 times per month. Fellows tended to report that residents were more competent and better prepared after UW-IPASS implementation, but all of these trends were not statistically significant (**Table 2**).

Effect on Resident Workflow

The duration of handoffs among residents during the intervention phase was unchanged compared with the control phase (estimated +5.5 minutes; 95% CI, 0.34-9.39; *P* = .30). Notably, these time estimates were self-reported by residents in response to daily postshift queries (Table 1). The number of orders placed in the EMR between 6 AM and 8 AM ("last-minute" order entry before rounds) was 106 per 100 patient-days in the control period, compared with 78 per 100 patient-days in the intervention period (−28 orders; 95% CI, −55 to −4; *P* = .04). Six of 30 attending physicians (19%) and 15 of 63 residents (23%) thought that UW-IPASS improved workflow, but 9 of 30 attending physicians (29%) and 13 of 63 residents (20%) thought that UW-IPASS slowed workflow.

Patient Outcomes

Overall, UW-IPASS was associated with trends toward a shorter ICU LOS and duration of mechanical ventilation, but these were not statistically significant findings. The number of reintubations within 24 hours of extubation was unchanged (**Table 3**).

Table 3. Patient Outcomes Before and After the Implementation of UW-IPASS[a]

Outcome	Control Period (2236 Patient-Days)	Intervention Period (1917 Patient-Days)	Estimated Mean Difference (95% CI)	*P* Value
ICU LOS, d	7.5 (2.0-11.4)	7.3 (5.1-9.5)	−0.2 (−2.6 to 2.5)	.88
Duration mechanical ventilation, d	4.3 (3.8-4.9)	3.5 (2.6-4.4)	−0.8 (−1.7 to 0.07)	.07
Reintubations within 24 h	33 (1.5)	22 (1.2)	0.1 (−1.1 to 1.4)	.88

Abbreviations: ICU, intensive care unit; LOS, length of stay.

[a] Continuous data are presented as means (95% CIs) and categorical data are presented as No. (%). Statistical significance was assessed using a mixed-effects logistic regression model, with model structure as (1) exposure of interest, UW-IPASS curriculum, (2) outcomes, as listed above, and (3) covariates: intensive care unit location, period, and individual clinician.

Clinician Satisfaction

After UW-IPASS implementation, 89 postintervention surveys and 25 interviews were conducted in a convenience sample of attending physicians, fellows, and residents/NPs/PAs (eTable in Supplement 2). Fifteen participants (60%) stated that they would rather work on a UW-IPASS unit than a non-UW-IPASS unit. Four additional participants (16%) said they would rather work on a unit with a standardized handoff tool but did not have a preference if the tool was UW-IPASS or not.

Notably, 26 of 30 attending intensivists (86%), 10 of 13 clinical fellows (73%), and 38 of 63 residents (61%) reported that team participation in IPASS results in improved patient safety. Most participants appreciated the standardization of handoff components and believed that all relevant areas of a handoff were included in the UW-IPASS tool. Overall, clinicians reported that the most useful aspect of the curriculum was the UW-IPASS rounding tool that was integrated into the EMR. Clinicians emphasized that the EMR tool helped to guide verbal handoffs and acted as a valuable visual prompt. Clinicians reported that the most useful aspect of the handoff mnemonic was the "illness severity" category. They noted that this category helped with prioritization and efficiency during their ICU shifts.

Discussion

Across 8 adult ICUs, the UW-IPASS handoff curriculum improved clinician preparedness. After training in UW-IPASS, clinicians felt more prepared by handoffs and reported higher scores for readiness to care for patients. These data suggest that UW-IPASS may optimize handoff communication.

Recent estimates suggest that medical errors are the third leading cause of inpatient death in the United States,[2,3] and both the Accreditation Council for Graduate Medical Education and the Joint Commission have identified handoff communication failures as the root cause of a third of all medical errors.[5,16] Therefore, research on effective handoff standardization is an urgent national priority.

This study can be most readily compared with the original IPASS article by Starmer and colleagues.[7] The authors conducted a multisite investigation with direct observation of handoffs and a detailed collection of data regarding medical error rates. Our data corroborate their finding that an IPASS-based curriculum improves communication and clinician preparedness for patient care. Although our study was not adequately powered to detect differences in medical error rates, it still supports the notion that IPASS-based curricula can effectively and safely standardize handoff communications in many clinical scenarios.

However, in contrast to the original IPASS investigation, our results indicated that the duration of handoff may have increased after the intervention. This may be the case for several reasons. First, our measurement of handoff duration relied on clinician recall and perception rather than direct measurement and may be subject to recall bias. Alternatively, it may be that the structure of UW-IPASS slowed down communication due to the addition of relevant information. Finally, it may be that with additional education and experience, the length of handoffs would decrease. Clinicians in our study used IPASS for only months at a time and, in some cases, only 6 weeks of postintervention data were collected. This is compared with the original study in which clinicians were immersed in the program for at least 6 months, with a subsequent 6 months of postintervention data collected.

UW-IPASS was associated with a significant decrease in the number of orders placed in the 2 hours before morning rounds. Many orders placed during this time could reflect last-minute changes from incoming residents who are attempting to rectify the night resident's oversights or delays in care before to morning rounds. In this context, these data suggest that UW-IPASS improves clinician preparedness and reduces miscommunication, thereby reducing the number of last-minute prerounding orders that are placed. However, this analysis of clinician order-entry patterns is a novel approach to assess quality improvement endeavors, and further validation of this metric is required before making any definitive conclusions.

As expected, given the relatively small sample size and the baseline high-quality care provided in this institution's ICUs,[17] this study did not detect a difference in aggregate patient outcomes, such as ICU LOS, duration of mechanical ventilation, or the number of reintubations. Although 2 studies of IPASS-based curricula have shown a positive effect on surrogate outcomes (clinician miscommunication and medical errors), it remains to be seen if UW-IPASS can positively affect ultimate clinical outcomes. Larger and longer-term studies are warranted to examine these clinical end points.

Limitations

There were several important limitations to this study. First, the data collected reflect the perception of clinicians, which is susceptible to recall and response bias, or even the Hawthorne effect. Second, curriculum participation and compli-

ance with IPASS handoffs was compulsory, but participation in surveys was entirely voluntary. Only 31% of eligible clinicians agreed to sign up for the study and this limits interpretation of clinician perceptions. The reason for low participation is unclear, but some clinicians stated that they were reluctant to receive a daily text message from our study team. Nevertheless, the surveyed clinicians were a representative sample of all disciplines and all clinician levels involved in the project. Third, the small sample size limits the ability to draw definitive conclusions regarding the perceptions of fellows on the curriculum and regarding clinical patient outcomes. Fourth, blinding of participants was not possible given the nature of this primarily educational intervention and the unethical nature of a sham intervention. Finally, our mixed-effects regression analysis rests on several assumptions, some of which may reflect an oversimplification of the data. These include an assumption that the variances were the same for clusters (ICUs) and that the intervention would have the same strength of treatment effect for all handoffs. Furthermore, given the fact that residents rotate between units, and thus some portion of residents would move from an intervention to a control unit, some level of contamination was expected, especially in the late control phases of the study. This violates the assumption of independence of the models. However, this was adjusted by including a unique clinician identifier variable in the regression models.

In addition to the effect on patient outcomes, further research is needed regarding the applicability of UW-IPASS to other clinical care scenarios outside of the adult ICU. The authors are currently joining with the institutional graduate medical education office to evaluate next-steps, including piloting UW-IPASS in the adult acute care floor setting, and medical and surgical subspecialties. While these results are relevant to all specialties, cogent communication is essential for the care of rapidly evolving surgical patients. Indeed, surgeons depend on clear communication from multiple teams and multiple clinician levels in perioperative care. Therefore surgical clinicians should take the leadership roles in these efforts to standardize handoffs. Sensitivity to local culture and service-specific needs are vital to a successful implementation of UW-IPASS.[12] Ultimately, the stakeholders and leadership at our institution are eager to standardize handoffs across specialties. Just as clinicians across the country, regardless of training history, communicate using the same written framework (subjective, objective, assessment, and plan), we anticipate that the future of verbal handoffs will be, and must be, collectively standardized.

Conclusions

UW-IPASS standardized handoffs resulted in fewer communication errors and improved clinician preparedness in 8 adult ICUs. IPASS-based curricula may be an important step forward in communication standardization efforts. These research efforts are timely and urgent because medical errors from handoff miscommunications continue to cause daily morbidity and mortality across American care health systems. Indeed, our medical and professional code of ethics mandate that we now prioritize the development of evidence-based handoff standardization.

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