



## I-PASS Reduces Medical Errors During Patient Handoffs



Preventable adverse events — injuries due to medical errors — are a major cause of death among Americans. Although some progress has been made in reducing certain types of adverse events, overall rates of errors remain extremely high. Failures of communication, including miscommunication during handoffs of patient care from one resident to another, are a leading cause of errors. The omission of critical information and the transfer of erroneous information during handoffs are common.

As resident work hours have been reduced, handoffs between residents have increased in frequency. Improving handoffs has become a priority in efforts to improve patient safety. However, few studies have rigorously evaluated the effectiveness of handoff-improvement programmes. New research on the topic appears in the *New England Journal of Medicine* .

In an earlier single-centre study, the authors found that the implementation of a handoff programme was associated with a reduction in medical-error rates and improvements in communication between residents at change of shift. After that study, the authors developed a bundle of interventions around a refined mnemonic, I-PASS (Illness severity, Patient summary, Action list, Situation awareness and contingency plans, and Synthesis by receiver). They hypothesised that multicentre implementation of the I-PASS Handoff Bundle would lead to improvements in communication and patient safety.

### Materials and Method

Researchers conducted a prospective systems-based intervention study on inpatient units at nine paediatric residency training programmes in the US and Canada between January 2011 and May 2013. At each site, researchers measured preintervention outcomes of interest for a six-month period, and then implemented the intervention during the next six months. Six months of postintervention data collection followed, matched by time of year to the preintervention data collection at that site.

During the intervention, all residents received training in handoff practices and were required to use I-PASS handoff processes while working on study units. However, only residents who provided written informed consent contributed additional observational, demographic, and survey data. Residents were offered small incentives (e.g., cookies and gift cards) to provide data.

The I-PASS Handoff Bundle included these seven elements: the I-PASS mnemonic, which served as an anchoring component for oral and written handoffs and all aspects of the curriculum; a two-hour workshop (to teach TeamSTEPPS teamwork and communication skills, as well as I-PASS handoff techniques); a one-hour role-playing and simulation session for practising skills from the workshop; a computer module to allow for

independent learning; a faculty development programme; direct-observation tools used by faculty to provide feedback to residents; and a process-change and culture-change campaign, which included a logo, posters, and other materials to ensure programme adoption and sustainability.

Error rates were measured through active surveillance. Handoffs were assessed by means of evaluation of printed handoff documents and audio recordings. Workflow was assessed through time–motion observations. The primary outcome had two components: medical errors (preventable failures in processes of care) and preventable adverse events (unintended consequences of medical care that lead to patient harm). Researchers also assessed nonpreventable adverse events, which were not expected to change after the intervention.

## Results

In 10,740 patient admissions, the medical-error rate decreased by 23 percent from the preintervention period to the postintervention period (24.5 vs. 18.8 per 100 admissions  $P<0.001$ ), and the rate of preventable adverse events decreased by 30 percent (4.7 vs. 3.3 events per 100 admissions,  $P<0.001$ ). The rate of near misses and non-harmful medical errors decreased by 21 per cent (19.7 vs. 15.5 near misses and non-harmful errors per 100 admissions,  $P<0.001$ ). The rate of nonpreventable adverse events did not change significantly (3.0 and 2.8 events per 100 admissions,  $P=0.79$ ).

Site-level analyses showed significant error reductions at six of nine sites. Across sites, significant increases were observed in the inclusion of all prespecified key elements in written documents and oral communication during handoff (nine written and five oral elements;  $P<0.001$  for all 14 comparisons).

There were no significant changes from the preintervention period to the postintervention period in the duration of oral handoffs (2.4 and 2.5 minutes per patient, respectively;  $P=0.55$ ) or in resident workflow, including patient–family contact and computer time.

Significantly more residents reported having received handoff training after the intervention (60.3 percent before the intervention vs. 98.9 percent after the intervention,  $P<0.001$ ). The proportion of residents who rated the overall quality of their handoff training as very good or excellent increased significantly after the intervention (27.8 percent before the intervention vs. 72.2 percent after the intervention,  $P<0.001$ ).

## Conclusions

Implementation of the I-PASS Handoff Bundle was associated with reductions in medical errors and in preventable adverse events and with improvements in communication without a negative effect on workflow. Site-level changes in error rates were observed at most participating institutions.

These findings support calls from professional and federal bodies to improve the patient-handoff process.

Image Credit: Boston Children's Hospital

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