

Hospital medical errors reduced 30 percent with improved patient handoffs

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Improvements in verbal and written communication between health care providers during patient handoffs can reduce injuries due to medical errors by 30 percent, according to a multicenter study led by researchers from Boston Children's Hospital. Reported Nov. 6 in the *New England Journal of Medicine (NEJM)*, study results show that I-PASS—an original system of bundled communication and training tools for handoff of patient care between providers—can greatly increase patient safety without significantly burdening existing clinical workflows.

Medical errors in hospitals such as diagnostic delays, preventable surgical complications and medication overdoses are a leading cause of death and injury in the U.S. An estimated 80 percent of the most serious medical errors can be linked to communication between clinicians, particularly during patient handoffs. For example, a handoff-related [medical error](#) could occur if information about a critical diagnostic test is not communicated correctly between providers at shift change; the result could be a potentially harmful delay in patient care.

"Miscommunications and handoff errors are two of the most significant causes of medical errors in hospitals in the U.S.," said the study's principal investigator and senior author, Christopher Landrigan, MD, MPH, of Boston Children's Division of General Pediatrics. "This is the first multicenter handoff improvement program that has been found to reduce injuries due to medical errors."

A multicenter team led by Landrigan and the study's lead author, Amy Starmer, MD, MPH, designed I-PASS with the goal of improving patient safety and reducing or eliminating the most common source of medical errors through improved provider-to-provider communication. I-PASS consists of:

- standardized communication and handoff

training

- a verbal handoff process organized around the verbal mnemonic "I-PASS" (Illness severity, Patient summary, Action list, Situational awareness and contingency planning, and Synthesis by receiver)
- computerized handoff tools to share patient information between providers using an I-PASS structure
- engagement of supervising attending physicians to observe and oversee handoff communications
- a campaign promoting the adoption of I-PASS as part of institutional process and culture

"We recognized that it would take a great deal of work to make the handoff program a sustainable system and encourage its adoption across hospitals," Starmer said. "We partnered with experts in research, curriculum development and administration, as well as local faculty and executives at the nine centers, to develop a comprehensive and multi-faceted handoff and communication program. Now the new I-PASS program works seamlessly with existing tools and is part of each institution's culture."

In the *NEJM* paper, Landrigan, Starmer and their colleagues report on the results of implementing I-PASS through the pediatric residency programs of nine hospitals:

- Benioff Children's Hospital, University of California San Francisco
- Cincinnati Children's Hospital Medical Center, University of Cincinnati
- Doernbecher Children's Hospital, Oregon Health Sciences University
- The Hospital for Sick Children, University of Toronto
- Lucile Packard Children's Hospital, Stanford University
- Primary Children's Hospital, University of

Utah

- St. Louis Children's Hospital, Washington University St. Louis
- St. Christopher's Hospital for Children, Drexel University
- Walter Reed National Military Medical Center, Uniformed Services University of the Health Sciences

Boston Children's Hospital served as the lead site for the study, while Brigham and Women's Hospital served as the data-coordinating center.

At each participating hospital, patient handoffs by residents were monitored and assessed for a six-month pre-intervention period. During the six-month intervention phase, residents were trained on I-PASS handoff processes and required to use the system going forward. An additional six months of monitoring and assessment followed the intervention.

Across the participating centers, the overall rate of medical errors decreased by 23 percent—from 24.5 to 18.8 errors per 100 admissions—after the introduction of I-PASS. Preventable adverse events (injuries due to medical errors) decreased by 30 percent—from 4.7 to 3.3 errors per 100 admissions. The research team's data covered a total of 10,740 patient admissions.

Time-motion analyses of providers' activities showed that implementing I-PASS did not add time to patient handoffs or decrease time spent at patient bedsides or on other tasks. The researchers noted significant improvements in residents' verbal and written communications at every center and a significant increase in residents' satisfaction with the quality of their patient handoffs after I-PASS implementation, according to a post-study survey.

"We took basic principles of [patient safety](#) and as a team found ways to integrate them into the normal workflow of hospital residents," Landrigan said. "We hope I-PASS will remain an embedded system within these institutions going forward."

"Because we know that miscommunications so commonly lead to serious medical errors, and because the frequency of handoffs in the hospital is

increasing, there is no question that high-quality handoff improvement programs need to be a top priority for hospitals," says Starmer. "It's tremendously exciting to finally have a comprehensive and rigorously tested training program that has been proven to be associated with safer care and that meets this need for our [patients](#)."

Landrigan and Starmer note that while the I-PASS bundle has been focused thus far on inpatient pediatric care, the principles are applicable to care in any [hospital](#) inpatient setting. And while not documented in the study, they believe that the safety improvements supported by I-PASS adoption could lead to substantial reductions in medical error-related health care costs.

Provided by Children's Hospital Boston

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