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PATIENT SAFETY INSTITUTE

DARTMOUTH-HITCHCOCK

Hospital-wide Standardization of Handoff Communication at Dartmouth-Hitchcock

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As Chief Quality and Value Officer at Dartmouth Hitchcock from 2012-2021 and Patient Safety Officer for the six years prior, Dr. Blike led high reliability initiatives across Dartmouth-Hitchcock, including efforts to improve communication and teamwork. He is a professor of Anesthesiology, Community & Family Medicine and holds a Masters in the Science of Healthcare Delivery from Tuck Business School.

Dartmouth Health

Patients:
1.9 million

Direct Care Nurses:
2,000+

Clinicians:
3,000+

Allied Health Professionals:
1,600+

The case for leveraging the I-PASS Bundle to enhance high reliability communication among clinicians in a tertiary medical center

With Dartmouth-Hitchcock's (D-H) data-driven process for delivering results on patient safety, our organization identified handoff intervention as a priority for improvement. To that end, D-H committed to implementing a standardized, evidence-based bundle of interventions to improve in-hospital patient handoffs between clinical staff. The goal was to ensure highly reliable communication of critical information, including patient illness severity, patient summary, action list, situation awareness and contingency planning, and synthesis by receiver—all key components of the I-PASS methodology. D-H estimated that focusing on improving handoff communication by implementing a clinically proven structured bundle would result in a 50% decrease in serious safety events organization-wide.

This case study highlights the rationale and business case for selecting a structured handoff communication method as the intervention to advance the reliability of our safety culture through the implementation of I-PASS, a proven safety-based behavior.

Recognizing and Implementing
Strategic Patient Safety Initiatives

Numerous evidence-based tools are available for improving handoff communication. Ensuring that I-PASS was the appropriate handoff tool for our organization was the result of a rigorous process. When selecting and implementing any improvement initiative, we always follow two important steps.

First, we keep our long-term strategic goals top of mind. A key goal for our organization is to become a leader in delivering value-based care by achieving top-decile performance in quality at below-average cost. The only way to achieve this goal is to identify key practices for improvement, execute them in a highly reliable manner, and eliminate all the non-value-added components in our care delivery processes. By achieving this strategic goal, we believe we will be positioned to not only deliver the best-quality care but be competitive in every payment model.

Second, when determining how best to achieve each long-term goal, we develop a strategic pathway that includes all the intermediate steps that must be accomplished sequentially or simultaneously. The pathway always recognizes that organizational leaders must manage the pace of change and build readiness at the organizational level. In this case, D-H had identified patient safety as a foundational milestone for becoming a leader in quality, and we adopted a high reliability organizing (HRO) framework to identify improvement opportunities. In addition, we established metrics and benchmarks for strategic initiatives to support goal setting and measure progress.

The steps we followed to deliver high reliability:

A   **Measure** serious safety events and classify root causes and failure modes

B   **Identify** safety-based behaviors that mitigate error and reduce failure

C   **Implement** prevention bundles (new tools, techniques, safety behaviors, etc.) and drive reliable use of these best practices until they become "habits"

D   **Build** the case for each major initiative

E   **Estimate** the value of improvement realized in terms of quality and cost

The Steps
to Achieving Our Patient Safety Goals

The story behind D-H's focus on handoff communication to improve patient safety and care coordination follows a data-driven process using our existing HRO infrastructure.

Measuring Serious Safety Events and Identifying Root Causes

Our journey to becoming a high reliability organization required that our senior leadership, including our CEO, executive leaders, and trustees, recognize that the appropriate goal for patient safety is zero preventable harm.[1] The infrastructure to achieve zero harm requires the ability to diagnose causes of error accurately and implement solutions designed to counter the identified risks. To this end, D-H participates in the Solutions for Patient Safety learning network[2] and has adopted the Safety Event Classification (SEC) system for its fidelity in identifying failure modes and ability to benchmark with other organizations measuring Serious Safety Event Rates (SSER).[3] In addition, D-H has invested in improving our ability to perform robust causal analysis using root cause, apparent cause, and common cause methodologies.[4] The ability to determine the failure modes driving harm in our healthcare delivery system allows our leadership to effectively prioritize and select high-impact improvement opportunities.

Initially, our baseline SSER was below average compared to available benchmarks. Initiatives to implement infection, pressure ulcer, and fall prevention bundles while improving D-H's safety culture by deploying interdisciplinary training on error prevention—with the introduction of basic safety-based behaviors—proved to be highly effective in reducing our SSER by more than 70%. While this meant we were in the top quartile, we had not achieved our goal of top-decile performance in patient safety.

D-H analyzes more than 100 serious, precursor, and near-miss safety events annually. Our analysis of events from 2017 to 2018 identified communication as a significant system failure mode in 27% of cases and an individual failure mode in 83% of cases that caused harm or had the potential to cause harm.

While D-H had deployed structured communication in a variety of individual and team interactions in the past (e.g., closed loop communication, Team STEPPS with trauma, SBAR for acute event management, various home grown OR to ICU/PACU hand-over protocols), a truly coordinated, interdisciplinary communication standard across the organization remained an opportunity for improvement. The I-PASS Bundle provided us the opportunity to enhance communication and care coordination while advancing our execution of high reliability behaviors and our creation of a highly reliable safety culture.

Selecting Safety-Based Behavioral Interventions to Mitigate Risks and Failure Modes

At D-H, we are confident in our ability to perform causal analysis and notice the patterns of failure associated with patient harm or potential harm. We concluded that communication was the priority risk (i.e., the highest-frequency, highest-severity risk) that we needed to better manage. We also believed D-H had developed the organizational readiness necessary to introduce and reinforce the new behaviors that would lead to improved outcomes.

Among communication interventions, we identified handoffs as a high-leverage activity to focus on, for three main reasons: 1) handoffs occur very frequently—more than 3,000 times per day across the inpatient facility; 2) they were directly or indirectly associated with the failures we observed; and 3) they offer a daily, if not more frequent, opportunity for providers to practice highly reliable two-way communication to improve team-based care. Further, we hypothesized those specific aspects of well-performed handoffs could reduce the cognitive bias we identified to be associated with diagnostic errors (i.e., events in which our clinical teams failed to diagnose serious but treatable complications in a timely manner). [5, 6]

Our review of communication interventions included the ISBAR communication structure[7]; the Agency for Healthcare Research and Quality's (AHRQ) TeamSTEPPS® strategies and tools[8, 9]; the Joint Commission Center for Transforming Healthcare's Hand-off Communications Targeted Solutions Tool®[10]; and the I-PASS Bundle[11]. D-H had direct experience using the I-PASS structured handoff communication process for selected roles within the Children's Hospital at Dartmouth (CHaD). D-H also had direct experience with TeamSTEPPS/Crew Resource Management Training and ISBAR. Through benchmarking, literature review, and direct experience, we concluded that the best intervention to mitigate the specific failure modes identified at D-H was with the I-PASS Bundle.[12]

Several factors weighed heavily in the decision:

The AHRQ-funded research conducted by the I-PASS team and the work of the I-PASS multicenter collaborative was reviewed in detail.[13]

The quality of the NEJM multicenter trial that quantified a significant reduction in adverse events similar to those occurring at D-H was associated with implementing the I-PASS Bundle.[14]

Benchmarking with multiple organizations was performed to better understand I-PASS implementation barriers and facilitators.

The detailed implementation planning and training scalability were in line with our requirements. For example, the I-PASS tools were ready to use with no added D-H resources required and were proven effective for asynchronous training and for training with large numbers of individuals online; I-PASS can be integrated with the electronic health record; and clinicians can print their patient lists with the salient information formatted in the I-PASS structure to support the handoff.[15]

The full bundle developed to support I-PASS implementation was important to us because we value interventions designed using human factors science and systems rooted in change management principles. Using the Systems Engineering Initiative for Patient Safety — SEIPS model, we found the I-PASS Bundle to be complete, comprehensive, and aligned to the principles we value.[16]

Prior to finalizing our selected handoff intervention, we measured our baseline handoff communication using the five I-PASS elements. Our results indicated **relatively reliable (>85%) communication** regarding the provision of 1) a patient summary; and 2) an action list of activities needing completion during the next shift. In contrast, our results indicated **unreliable (<30%) communication** of 3) illness severity and prioritization of patient lists; 4) contingency planning to assure good situational awareness of potential patient issues to watch out for and a planned response; and 5) synthesis of the information by the receiving clinician, an activity that should reduce diagnostic decisional errors.[17]

Implementing Prevention Bundles and Driving Reliable Use

Once we had selected I-PASS as the intervention method of choice, we moved from focusing on "what" the method would be to "how" we would successfully implement the solution in a way that would ensure broad adoption. We understand and respect how difficult broad-based, interdisciplinary behavior change can be to implement and sustain, so while D-H has robust implementation science resources, we also included in the adoption process a large team of quality and operational specialists from our Value Institute at Dartmouth-Hitchcock[18] who are skilled in Lean/Six Sigma tools and methods. Additionally, we value our ability to internally source the implementation of basic and intermediate complexity interventions. However, with a complex intervention such as the I-PASS Bundle, we recognized that external expertise can be invaluable. Generally, we look for external consultants who have at least five proven implementations in the varied contexts we plan to encounter to ensure expertise in the facilitators and barriers to implementation.

Prior to implementation, D-H engaged in an organizational readiness assessment with the I-PASS Institute.[19] Based on the findings, along with our external benchmarking, D-H set implementation specifications and requirements. The scope was set to start with the tertiary medical center and spread to all system members and all roles. A goal of reducing SSEs by 50% over three years was identified as achievable based on I-PASS outcomes studies and the pattern of failures identified.

The essential bundle elements were deemed to be as follows: online self-paced training, train-the-trainer coaching, adaptation of the I-PASS process for specific roles, process integration into the EHR by the D-H EPIC team, and key performance metrics regarding I-PASS Bundle implementation and outcomes. We determined that this would require three years to complete and would be performed in three phases with six to eight waves.[8] We collaborated with external consultants from I-PASS to leverage their expertise and scalable tools, and used our internal resources to tailor and customize the interventions to our specific context and culture so that we could promote "stickiness" and ensure sustainability. We also identified I-PASS champions, including our CNO, Respiratory Therapy Director, Surgical Leader, and Hospitalist, to conduct train-the-trainer sessions and coach our peer coaches, as this was recognized as a critical resource to fund our I-PASS Institute engagement.
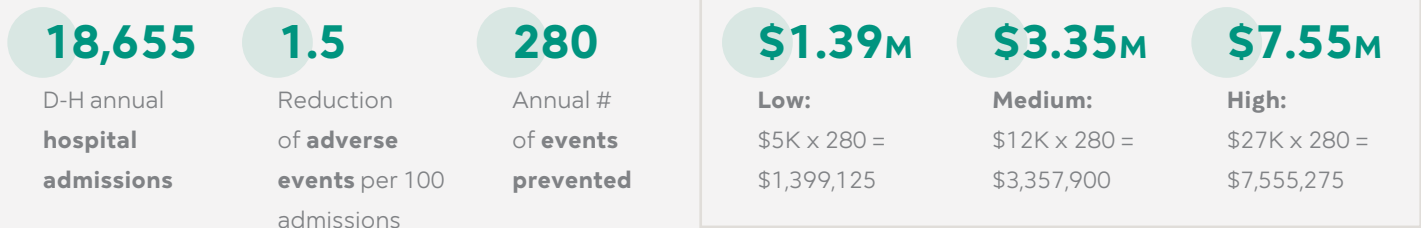
Building the Case for I-PASS

Next, we built a quality and financial business case proposal that was vetted by our senior leadership and subsequently built into our annual operating plan organization-wide. Ultimately, the proposal was approved by our Board of Trustees.

Estimated ROI opportunities identified for implementing a high reliability handoff process are highlighted on the next page.

ROI #1: Reduce Adverse Events

I-PASS handoff program projected to reduce adverse events by 1.5/100 (Starmer et al., New England Journal of Medicine, 2014).

18,655
D-H annual **hospital admissions**

1.5
Reduction of **adverse events** per 100 admissions

280
Annual # of **events prevented**

ESTIMATED COST PER EVENT

$1.39M
Low:
$5K x 280 =
$1,399,125

$3.35M
Medium:
$12K x 280 =
$3,357,900

$7.55M
High:
$27K x 280 =
$7,555,275

ROI #2: Reduce Diagnostic Decisional Errors

Standardized handoff elements of assessing acuity, contingency planning and verbal report-back verification could represent a cognitive de-biasing strategy.

Diagnostic error can be related to multiple heuristic biases during "fast" pattern recognition processing. These effects are disrupted by "slow reasoning" that is activated by verbalization.

Complication recognition and response involves diagnosis and should be improved if responding clinicians have been "primed" with the information provided in a high quality I-PASS handover.

ROI #3: The I-PASS process is adaptable, improves shift preparedness and improves satisfaction/should reduce stress due to disorganized and fragmented handoffs.

I-PASS is adaptable to be used in **multiple roles and clinical settings**.[20]

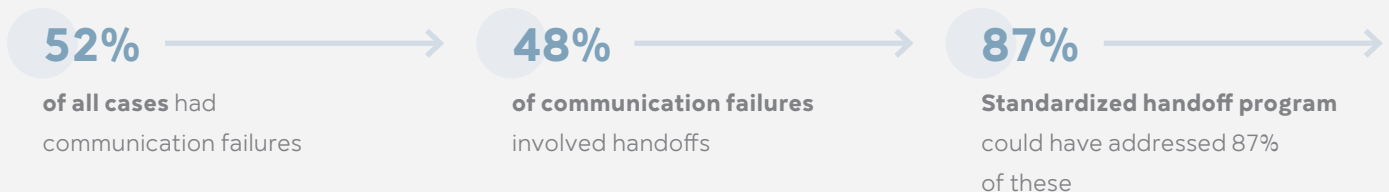I-PASS is associated with **improved clinician preparedness**.[21]

I-PASS structure handoff is associated with **improved satisfaction** by clinicians.[22]

ROI #4: Ensure Regulatory Compliance

The Joint Commission (sentinel event alert) and the ACGME (CLER Survey) have both referenced the need for standardized handoffs (Joint Commission, Sentinel Event Alert 58, 2017; ACGME, Common Program Requirements).

ROI #5: Reduce medical malpractice liability exposure based on CRICO Malpractice Database Study (Humphrey K, et al. Incidence and preventability of communication related medical malpractice claims. PAS Annual Meeting, May 2017, San Francisco, CA) Retrospective analysis of 420 cases (2009-2013).

52%
of all cases had communication failures

48%
of communication failures involved handoffs

87%
Standardized handoff program could have addressed 87% of these

NOTE: As we execute a multiyear, cross-disciplinary intervention, we monitor progress with regular executive sponsor project updates. The D-H and I-PASS Institute implementation teams highlight implementation milestones achieved, barriers encountered, and issues requiring resolution. Key performance metrics are also reviewed. For example, implementation was impacted by COVID-19 and required a pause and shift in the timeline of approximately three months. A summary of the implementation and preliminary results achieved was presented at the IHI/NPSF Congress in May 2021.[17]

Estimating the Value of Improvement and Intervention

Although care failures (overuse, underuse, misuse/defective care) are often reimbursed, improving these errors in care almost always benefits a business's bottom line. To quote Swensen, Mayo Clinic's former Chief Quality Officer:

"Defects in handoffs and communication are an important contributor to a large proportion of sentinel events in this country… **We are confident that work to augment multidisciplinary teamwork, relational coordination, and improved handoffs better serves our patients and delivers a financial ROI via fewer errors and greater productivity.** It is difficult to accurately quantify most of these gains. We believe they are real and part of the business case, although we cannot confidently attach hard or soft dollar savings to them.[23]

D-H shares these views held by the Mayo Clinic health system quality leadership. Of note, as D-H implements quality improvement initiatives, we continue to track and trend the impact of improvement over time on major morbidity and mortality outcomes.

Reducing events of preventable patient harm is an ongoing challenge for any organization. For D-H, analysis of safety events related to in-hospital patient handoffs between clinical staff, along with commitment from executive leadership to establish a clear, standardized, and evidence-based methodology for improving communication during handoffs, was an important step in our patient safety journey. As our selected methodology for optimizing patient handoffs, the I-PASS Bundle adds a valuable safety measure that will support our strategic patient safety initiatives and continue to guide us toward our goal of zero preventable harm.

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About I-PASS

The I-PASS Patient Safety Institute is a clinical leader in patient safety, enabling a standard of care for patient handoffs and closed-loop communication. Founded by clinicians in 2016, the I-PASS Institute leverages expert mentorship paired with technology and digital tools to scale the I-PASS methodology. The I-PASS Institute's solution, the I-PASS Bundle, consists of three core technical components: I-PASS Training, I-PASS Assessment and Improvement, and I-PASS eVIEW. When all three platforms are used in unison and with the guidance of an expert coach, institutions are able to reduce patient harm caused by miscommunication. The I-PASS Bundle is currently implemented at more than 100 institutions in areas ranging from pediatrics and residency programs to nursing and transitions of care with families.

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