Partnering with pediatric patients and families in high reliability to identify and reduce preventable safety events

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Cover Page Footnote

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Abstract

Frameworks for designing highly reliable behaviors and tools to reduce preventable harm are the result of the continued effort to improve patient safety in healthcare. Evidence shows that there has been limited research on engaging patients and families in the development of safety and reliability efforts to achieve zero harm. Our aim was to develop a tool that engages patients and families in an effort to reduce preventable harm in a pediatric academic medical center.

Introduction:

Rationale
In conjunction with a system-wide patient safety initiative, Boston Children's Hospital (BCH), a comprehensive academic center for pediatric healthcare, embarked on an effort to integrate patients and families in reducing preventable harm by developing a specific patient and family toolkit. In 2014, our senior leadership identified an opportunity to integrate high reliability principles across the enterprise, rolling out a comprehensive plan to educate all employees in the science of high reliability practices and integrate this with our philosophy of patient and family centered care. Once this phase of our high reliability work was completed, we identified an opportunity to engage our patients and families as partners in this work. Specifically, this included the development of a program to educate and partner with our families to improve safety by creating a specific process for them to report their safety concerns.

Specific Aims
In 2015, the Boston Children's Hospital High Reliability Safety Leadership Core Team Family Partners expressed interest in developing the Boston Children's Hospital Patient and Family High Reliability Partnership Initiative. The primary purposes of developing this quality improvement initiative were to pioneer the involvement of patients and families in identifying and preventing harm through a series of tools and behaviors and to expand the use of the safety behaviors and tools (initially aimed at staff to staff interaction) to patients and families while demonstrating their importance as part of the care team.

The specific aims of this quality improvement project were to:

- Establish a baseline of reported safety events in which parents or family members identified potential or actual safety events
- Reduce preventable safety events in which patients and families participated in care to avoid harm

Problem Description
The historic 1999 Institute of Medicine report "To Err is Human: Building a Safer Health System"[1] brought medical errors and patient harm to the forefront of our healthcare system. This report served as a catalyst to a number of patient safety programs and initiatives over the years, such as the 100,000 Lives Campaign from the Institute for Healthcare Improvement,[2] Nine Patient Safety Solutions from the World Health Organizations,[3] and most recently, High Reliability in Health Care led by the Joint Commission for Transforming Healthcare.[4] The Joint Commission reported that adapting and applying the lessons of high reliability science to the health care industry offers the promise of enabling health care to reach levels of quality and safety that are comparable to those of the best high-reliability organizations.[5]

High reliability means achieving and sustaining a heightened level of safety in high risk moments.[6] Principles of high reliability were developed in industries susceptible to catastrophic or hazardous events, such as nuclear power

and commercial aviation, to reduce errors and prevent harm.[7] Many industries have had success in this regard. For instance, in the nuclear power industry, the number of significant reactor events has decreased from 2.5 events per plant to 0.1 events.[8] Similarly, between 1998 and 2008, the fatality risk in the United States commercial aviation industry has decreased by 83 percent.[9]

In their review of high reliability organizations (HRO), Weick and Sutcliffe noticed that industries operating in dynamic, complex and high risk situations continually functioned in a state of organizational mindfulness[7]. They identified five characteristics of a HRO (Table 1).

Despite the benefits of adopting high reliability practices, several distinctions must be made between how high reliability principles and tools are applied in healthcare versus other industries like aviation or nuclear power.[10] At the center of healthcare are people, like patients and families, rather than machines or processes like in the nuclear power or airline industries. Clinical conditions, behaviors, compliance and reactions of patients and families are often unknown and can change over time, leading to a level of unpredictability that may not exist in other industries.

Additionally, there are two major safety culture differences between the aviation and nuclear power industries and healthcare. First, the aviation industry has a blame free culture supported by full transparency of safety events.[11] The healthcare industry, however, has historically functioned in a hierarchical structure with variation in the level of transparency related to errors. Second, safety is the top priority in both the airline and nuclear power industries. In healthcare, the importance of putting safety first is still not universal.[11] Most often, financial performance competes with safety as the top priority for healthcare institutions.

Despite safety culture differences, healthcare has been able to demonstrate success with tools based on high reliability principles. Checklists have proven to be effective in healthcare. For example, evidence based central line insertion checklists have shown to reduce central line infections by 66% in adult intensive care units.[12] In addition, using robust process improvement tools have been shown to demonstrate effectiveness in improving hand hygiene. A Joint Commission effort focused on using robust process improvement tools to find specific root causes of failures and interventions to prevent them from re-occurring increased hand hygiene performance at a group of eight participating hospitals from 48% to 81%.[5] These hospitals were able to sustain the improvement for a period of ten months by identifying and engaging responsible owners to oversee the improved processes.[5]

Although high reliability principles have begun to be adapted and applied to the health care industry over the past several years, there has been minimal work to date detailing implementation programs to engage patients and families in reducing preventable harm.[13] However, a recent study concluded that families are an underused source of data about errors, including preventable harm.[14] Furthermore, studies have shown that patients are willing to participate in providing safe care[15, 16] but require education on what they can do to promote their safety and also how to apply these skills with all members of the care team.

The literature demonstrates that patients and families are underused in terms of identifying safety issues and are also willing to participate in their care in order to ensure safety. We recognized that there was a potential opportunity to expand our high reliability efforts aimed at reducing preventable safety events to patients and families in order to improve both our safety culture and our rate of safety events.

Table 1: Adapted from Weick KE, Sutcliffe KM. Managing the unexpected. Hoboken, NJ: Jossey-Bass; 2007

Characteristics of HRO:	Definition:
Preoccupation with Failure	avoid complacency by considering small failures as important as large failures
Reluctance to Simplify	appreciate the complexity of the situation and investigate all options
Sensitivity to Operations	promote situational awareness by addressing early concerns of people or signals on the front-line
Commitment to Resilience	develop ability to learn from mistakes, correct and move forward
Deference to Expertise	accept that decision-making is made by those with the most knowledge regardless of rank or title

Available Knowledge
A literature search demonstrates there has been an increase in patient engagement research over the past several years. There are still limited resources available to guide the education and implementation of safety and reliability toolkits for patients and families. Research is even more limited in this area with regards to pediatric care and involving both patients and families (Table 2).[17]

Since we were primarily interested in a tool for a pediatric environment, it is important to further note that distinctions must also be made between pediatrics and adult care in healthcare. For example, a study showed that implementing a central insertion bundle in pediatric intensive care units did not have the same impact as adults.[12] This led us to believe that implementation of pediatric high reliability tools may require more customization than adult tools.

Table 2. Table of Evidence

Author/Year	Purpose	Type of Study	Findings	Recommendations
Institute of Medicine, 2000	To introduce and describe the prevalence of preventable medical errors in United States healthcare system	Expert opinion (Level 7)	Between 44,000 and 98,000 people die in hospitals each year as a result of medical errors that could have been prevented	A combination of activities (adequate leadership, attention, and resources) can offer a roadmap toward a safer health system in the United States
Berwick, D., Calkins, D., McCannon, C., & Hackbarth, A.,(2006).	To introduce and describe *The 100,000 Lives Campaign,*a a nationwide initiative launched by the Institute for Healthcare Improvement (IHI) to significantly reduce morbidity and mortality in American health care	Expert opinion (Level 7)	Applying the best methods to reduce patient harm in a reliable way can improve care	Reliably implementing several initiatives (rapid response teams, evidence based care for acute myocardial infarction, prevent adverse drug events, prevent central line infections, prevent surgical site infections, prevent ventilator-associated pneumonia) can greatly reduce morbidity and mortality
Chassin M, Loeb J, 2013	Discuss how adapting and applying the lessons of high reliability science to health care offers the promise of enabling hospitals to reach levels of quality and safety that are comparable to those of the best high-reliability organizations	Expert opinion (Level 7)	The ways in which other high-reliability organizations develop and maintain high levels of safety cannot be directly applied to today's hospital settings	Defined a series of incremental changes (leadership's commitment to achieving zero patient harm, a fully functional culture of safety throughout the organization, and the widespread deployment of highly effective process improvement tools) that hospitals should undertake to progress toward high reliability

Table 2 (cont). Table of Evidence

McKeon L, Oswaks J, Cunningham P, 2006	Describe ways in which health care is looking outside of the industry for ways to improve safety and care	Expert opinion (Level 7)	Military and aviation industry strategies have great potential to create safer care but cultural and system barriers to achieving high reliability performance within healthcare exist	Despite cultural and system barriers to adopting strategies from other industries exist, there are strategies that health care can adapt and adopt to overcome barriers
Kaissi A, 2012	Describe opportunities in which health care can learn from other industries with innovative practices	Expert opinion (Level 7)	There are a variety of similarities (complexity, time-critical events unpredictability, rare deviations, lengthy training) and differences (personal risk, public perception, litigation, level of training and roles, authority structure within teams, culture of standardization, oversight, labor unions, outside authority) between health care and aviation industries	Adoption of innovations from other industries must start with early adopters followed by influential organizations (i.e. Joint Commission) in order to spread behaviors across the health care industr
Kapur N, Parand A, Soukup T, Reader T, Sevdalis N, 2016	Develop a table of comparative features and a conceptual framework for patient safety on the basis of a detailed review of relevant publications that examine patient safety in the context of aviation practice	Systematic review of descriptive and qualitative studies (Level 5)	There are many opportunities for concepts in high-risk industries such as aviation to be considered for adoption in healthcare	Healthcare can consider adopting the concepts of the need for actions to be proactive and generative, rather than solely reactive to adverse events; focus on systems rather than individuals; examine latent risk factors. Adapt adopted measures to the healthcare setting
Pronovost P, Needham D, Berenholtz S, Sinopoli D, Chu H, Cosgrove S, Sexton B, Hyzy R, Welsh R, Roth G, Bander J, Kepros J, Goeschel C, 2006	Present and discuss results of a collaborative cohort study in Michigan ICUs that used an evidence-based intervention to reduce the incidence of catheter-related bloodstream infections	Collaborative cohort study (Level 4)	Median rate of catheter-related bloodstream infection per 1000 catheter-days decreased from 2.7 infections at baseline to 0 at 3 months after implementation intervention. Mean rate per 1000 catheter-days decreased from 7.7 at baseline to 1.4 at 16 to 18 months of follow-up (N=102 ICUs)	Projects focused on reducing catheter related bloodstream infections are feasible and can have public health impacts.

Table 2 (cont). Table of Evidence

Miller M, Griswold M, Harris J, Yenokyan G, Huskins W, Moss M, Rice T, Ridling D, Campbell D, Margolis P, Muething S, Brilli R, 2010	Develop and evaluate effective catheter care practices to reduce pediatric catheter-associated bloodstream infections	Multi-institutional, interrupted time series design with historical control data (Level 4)	Average CA-BSI rates were reduced by 43% across 29 PICUs (5.4 vs 3.1 CA-BSIs per 1000 central-line-days). Insertion-bundle compliance was 84%. Maintenance-bundle compliance was 82%	Increasing insertion-bundle compliance alone cannot help PICUs to eliminate CA-BSIs completely. The main drivers for additional reductions in pediatric CA-BSI rates are issues that surround daily maintenance care for central lines
Berger Z, Flickinger T, Pfoh E, Martinez K, Dy S, 2014	Examines how interventions encouraging patient engagement have been implemented in controlled trials	Systematic review (Level 5)	Six articles met the inclusion criteria of having a primary focus on patient engagement. Definitions of patient and family engagement were lacking, as well as evidence regarding the types of patients who might feel comfortable engaging with providers	There is insufficient high-quality evidence regarding the successful implementation of patient engagement in safety. Future studies should evaluate the effectiveness of interventions on patient and family engagement and clarify the incorporating engagement in multifaceted approaches to improve patient safety as well as developing strategies to assess and overcome barriers to patients' willingness to actively engage in their care
Khan A, Furtak S, Melvin P, Rogers J, Schuster M, 2016	Determine the frequency with which parents experience patient safety incidents and the proportion of reported incidents that meet standard definitions of medical errors and preventable adverse events (AEs)	Cohort study (Level 4)	Parents surveyed (81% response rate; N=383). 34 parents (8.9%) reported 37 safety incidents. 62% (n = 23) were determined to be medical errors. 24% (n = 9) were determined to be other quality problems. 14% (n = 5) were determined to be neither. 30% (n = 7; 1.8 per 100 admissions) of medical errors caused harm (i.e. were preventable AEs)	Families are an underused source of data about errors, particularly preventable AEs. Hospitals may wish to consider incorporating family reports into routine safety surveillance systems

Table 2 (cont). Table of Evidence

Marella W, Finley E, Thomas A, Clarke J, 2007	Assess health care consumers' inclination to engage in selected patient safety practices	Randomized telephone survey (Level 6)	There are distinct differences in health care consumers' self-reported inclination to engage in various patient safety practices	Health care consumers are inclined to engage in practices intended to promote their own safety. Interventions to increase comfort necessary to increase patient engagement in safety
Waterman A, Gallagher T, Garbutt J, Waterman B, Fraser V, Burroughs T, 2006	Describe findings of whether patients will take recommended actions in error prevention and if involvement in safety effects patient satisfaction	Telephone interview (Level 4)	91% percent agreed that patients could help prevent errors. Patients were very comfortable asking a medication's purpose (91%), general medical questions (89%), and confirming their identity (84%).Were uncomfortable asking medical providers whether they had washed their hands (46% very comfortable). While hospitalized, many asked questions about their care (85%) and a medication's purpose (75%), but fewer confirmed they were the correct patient (38%), helped mark their incision site (17%), or asked about hand washing (5%)	Patients who were very comfortable were most likely to take action. Interventions to increase comfort with error prevention necessary to help patients become more engaged

Context

Patient and Family Engagement
At Boston Children's Hospital, patients and their families are recognized as the experts of their health care experience. In order to truly understand their views and respond to their needs, BCH has formed important partnerships to give families a strong voice through the Family Partnerships program. The program connects families with Boston Children's teams, committees and councils. Together, patients, families and hospital staff work on projects to improve the hospital experience and to ground our approach to care in a truly family-centered way.

The Family Advisory Council is one of the core pieces of BCH's Family Partnerships program. The goal of the Family Advisory Council is to ensure that patients and families are at the center of every decision that affects quality of care, safety, or patient experience. Family Advisory Council members are embedded in the fabric of the institution, serving on boards and committees and building meaningful partnerships with leadership and staff. Members who serve on committees and teams are referred to as Family Partners.

BCH High Reliability Journey
Understanding that high reliability principles have demonstrated success within healthcare organizations, Boston Children's Hospital began work to improve the

culture of reliability and safety to reduce preventable harm to patients and employees in 2014. Prior to developing this system-wide high reliability safety initiative, a comprehensive safety culture diagnostic assessment was completed and recommendations were presented across all levels of the BCH enterprise. This work guided the development of a system-wide plan to achieve an even higher level of reliability.

As a Board sponsored priority, the high reliability initiative was led by the Executive Vice President of Health Affairs and Chief Operating Officer, and the Senior Vice President, Patient Care Services and Chief Nursing Officer.

Formation of a diverse operational leadership committee with representatives from clinical, administrative and support departments was critical to enterprise-wide adoption. In the initial design, leadership asked that BCH launch the high reliability initiative outside of the traditional patient quality and safety realm and engage with hospital team members in a different way. In order to have broad adoption, the high reliability initiative moved forward with a shared understanding that the focus was more than patient safety. Patient and employee safety as well as the patient and family experience would ultimately form the triumvirate of principles that would create a high reliability culture across the entire BCH enterprise.

The objective of the High Reliability Safety Leadership Core Team was to set the strategy to lead the safety culture improvement at BCH. Moving forward with the philosophy that high reliability was more than patient safety, a conceptual model was created to express the relationship between patient safety, employee safety, and patient experience. This "umbrella" model guided the Core Team's strategy and implementation of all aspects of the high reliability initiative (Figure 1).

The High Reliability Safety Leadership Core Team was led by the Vice President and Associate Chief Nursing Officer of Surgical Services and the Medical Director of Transport & Medical Surgical Intensive Care Unit Operational management of the initiative was led by an administrative team within Patient Care Services, including a program manager. Membership of the Core Team included clinical and administrative leaders throughout the institution. Representatives included physicians from the Departments of Medicine and Surgery, Marketing and Communications, Human Resources, Patient Safety and Quality, Employee Safety, Clinical Education and Informatics, Facilities Engineering, and Family Partners. Including two Family Partners who also served on the Family Advisory Council was integral to creating a patient and family centered program. This cross section of members from across the enterprise ensured that BCH had stakeholders from all major departments and roles and

Figure 1. Umbrella Model of High Reliability

were inclusive of both clinical and non-clinical areas (Figure 2).

The addition of a Finance representative was added to the Core Team membership in 2016 as the Core Team recognized that an additional non-clinical presence was needed in order to strengthen the messaging of high reliability culture to non-clinical staff. A representative from Legal was also added in 2016 in order to more effectively review material such as pieces of the implementation phases that included increased sharing and transparency of preventable harm and safety concerns.

BCH chose to launch its safety culture improvement efforts over the course of an eighteen month design and implementation phase. This project length was selected due to the length of the contracted engagement with the third party vendor who would provide support and expertise in high reliability. The sustainability phase of the project would begin in 2017 after the initial implementation was completed. The initial project track, although somewhat aggressive in length, proved to be an adequate amount of time to design and launch the key pieces of the High Reliability initiative at BCH.
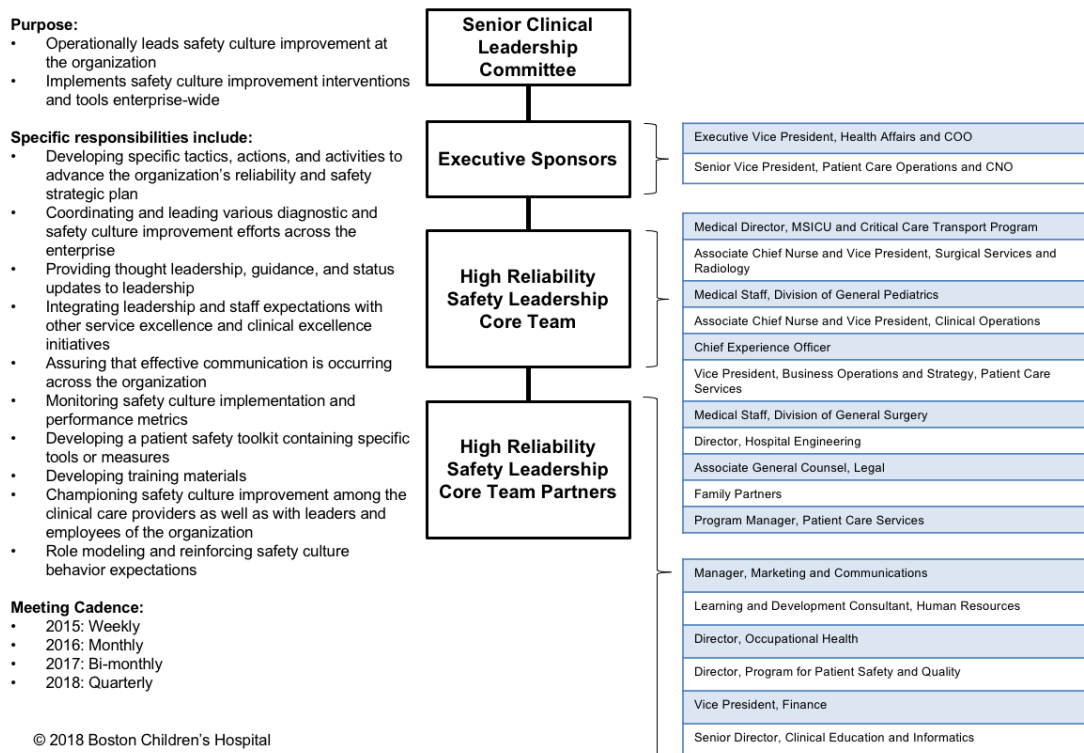
Initial Phase:
- Introduce key leadership methods of Daily Operations Briefing and Rounding to Influence
- Develop and launch communication plan
- Complete leadership training of 350 operational and senior leaders to provide tools and support while serving as a leader of high reliability for front line staff
- Complete Error Prevention Training of all eligible staff
- Improve Safety Event Response and Analysis of patient and employee safety events

Sustainability Phase:
- Continue to sustain and improve implemented initiatives from initial phase
- Embed high reliability principles into culture of organization
- Develop projects to support and sustain key high reliability principles

The initial implementation phase, although successful, presented significant challenges for the High Reliability Safety Leadership Core Team to address and overcome.

Figure 2. High Reliability Team Structure

Purpose:
- Operationally leads safety culture improvement at the organization
- Implements safety culture improvement interventions and tools enterprise-wide

Specific responsibilities include:
- Developing specific tactics, actions, and activities to advance the organization's reliability and safety strategic plan
- Coordinating and leading various diagnostic and safety culture improvement efforts across the enterprise
- Providing thought leadership, guidance, and status updates to leadership
- Integrating leadership and staff expectations with other service excellence and clinical excellence initiatives
- Assuring that effective communication is occurring across the organization
- Monitoring safety culture implementation and performance metrics
- Developing a patient safety toolkit containing specific tools or measures
- Developing training materials
- Championing safety culture improvement among the clinical care providers as well as with leaders and employees of the organization
- Role modeling and reinforcing safety culture behavior expectations

Meeting Cadence:
- 2015: Weekly
- 2016: Monthly
- 2017: Bi-monthly
- 2018: Quarterly

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Senior Clinical Leadership Committee

Executive Sponsors
- Executive Vice President, Health Affairs and COO
- Senior Vice President, Patient Care Operations and CNO

High Reliability Safety Leadership Core Team
- Medical Director, MSICU and Critical Care Transport Program
- Associate Chief Nurse and Vice President, Surgical Services and Radiology
- Medical Staff, Division of General Pediatrics
- Associate Chief Nurse and Vice President, Clinical Operations
- Chief Experience Officer
- Vice President, Business Operations and Strategy, Patient Care Services

High Reliability Safety Leadership Core Team Partners
- Medical Staff, Division of General Surgery
- Director, Hospital Engineering
- Associate General Counsel, Legal
- Family Partners
- Program Manager, Patient Care Services
- Manager, Marketing and Communications
- Learning and Development Consultant, Human Resources
- Director, Occupational Health
- Director, Program for Patient Safety and Quality
- Vice President, Finance
- Senior Director, Clinical Education and Informatics

As the initiative involved all departments, programs, and roles throughout the entire enterprise, the project structure proved to be difficult to implement. Like many other healthcare organizations, our physician groups are not employed directly by the hospital. Without direct accountability to senior leadership, ensuring that physicians were bought in to the high reliability framework, as well as the expectations of the initiative, were difficult to achieve without significant effort. In order to make sure that physicians were truly embedded in the safety culture shift, the High Reliability Safety Leadership Core Team needed to take an approach to create opportunities to ensure physician involvement and approval was included in every step of strategy development and implementation. Our physician colleagues recognized the importance of high reliability principles and it was the pervasive challenge of the Core Team to ensure we included this group in the key project decisions every step of the way. The Core Team felt strongly that if the medical staff were not being asked to complete Error Prevention Training like the rest of the organization, the impact on our safety culture and potential for reducing serious safety events would not be nearly as significant.

Another challenge presented to the High Reliability Safety Leadership Core Team during the initial implementation phase was demonstrating that the interventions that had been put into place had the potential to have an impact on reducing our serious safety events. The projected trajectory of any healthcare organization engaged in high reliability is that the rate of serious safety event reporting will increase as more awareness is brought to the importance of reporting safety events through Error Prevention Training. As more staff were trained, more recognized the importance of reporting safety events in our safety event reporting system which led to an increase in our event rate. This ultimately led BCH to a new baseline of serious safety events. However, it was difficult to explain to many throughout the organization that our event rate was not actually increasing. Rather, our reporting rate was increasing and more events were being reported than we had previously known. This rate would serve as our new baseline that would guide us to measure impact. The Core Team was challenged with pushing forward and persevering to continue to implement initiatives that would reduce our serious safety event rate despite the concerns from many throughout the organization that the projected impact was not coming to fruition.

Initial Intervention: Employee Toolkit Development
In June 2015, over 100 invited BCH executive leaders, operational managers, physicians, frontline staff, and Family Advisory Council members were invited to attend a Culture Design Day. Each member was selected to attend based on their role in the organization as it related to the safety culture. The purpose of this session was to provide

education about how people make errors, the types of errors commonly made, successful error prevention strategies used in other high-risk industries, and the primary contributors to errors at Boston Children's Hospital.

The Culture Design Day resulted in the selection of three core safety and reliability behaviors as well as nine error prevention tools to establish behavioral expectations that could potentially reduce patient and employee harm, our Error Prevention Toolkit. This "Error Prevention Toolkit" formed the core content of the Error Prevention Training which was rolled out to more than 17,000 BCH staff in October 2015 and was completed with 100% of eligible staff receiving training in January 2017 (Figure 3). Error Prevention Training is now embedded into the orientation process for all newly hired team members at BCH as part of the sustainability phase of the initiative.

Primary Intervention: Patient and Family High Reliability Partnership Initiative Development
In 2015, the Boston Children's Hospital High Reliability Safety Leadership Core Team Family Partners expressed interest in involving patients and families in the use of high reliability safety behaviors and tools. Since Boston Children's Hospital is committed to involving patients and families in safety, quality, and experience initiatives, the Core Team pursued developing the "Boston Children's Hospital Patient and Family High Reliability Partnership Initiative."

This initiative included extending our "Error Prevention Toolkit" to patients and families. Our Family Partners served a critical role in the development of this initiative. Since they were heavily involved in the implementation of the employee toolkit, they understood the intent behind each objective and tool. Through a continuous feedback and review process, the Family Partners were able to assist the High Reliability Safety Leadership Core Team in developing content that could easily be understood and utilized by families and patients while at BCH. Family Partners suggested language that better captured objectives for a non-medical audience while at the same time ensuring that the overall concepts and behaviors were consistent with the employee toolkit.

Several versions of the content were created and reviewed in order to ensure that the most universally understood language was used. For example, the tool "Ask Clarifying Questions" that was used in the employee toolkit did not resonate strongly with Family Partners. They felt that this concept needed to be clearer in order to help patients and families understand and use the concept more easily. After several rounds of feedback and wording changes, the final toolkit includes the phrase "Let me ask a question so I am clear" and encourages families to speak up and ask questions when something does not seem right with their

Figure 3. Error Prevention Training

AT BOSTON CHILDREN'S HOSPITAL
EVERY MOMENT MATTERS

SPEAK UP FOR SAFETY
- CROSS-CHECK EACH OTHER
- ESCALATE CONCERNS
- HAVE AND ENCOURAGE A QUESTIONING ATTITUDE

COMMUNICATE CLEARLY
- ASK CLARIFYING QUESTIONS
- USE SBAR [SITUATION, BACKGROUND, ASSESSMENT, RECOMMENDATION]
- USE STRUCTURED HANDOFFS
- USE CLOSED-LOOP COMMUNICATIONS

PAY ATTENTION TO DETAIL
- SELF-CHECK USING STAR [STOP, THINK, ACT, REVIEW]
- HONOR DISTRACTION-FREE ZONES

child's care. Consistency between the employee toolkit and the patient and family initiative proved to be incredibly important since it strengthened the idea that parents and families are core members of their child's care team. It is important to note that a limitation of the tool development was that only English speaking and bi-lingual (Spanish) families were involved in the review process. Family Partners also helped in the development of various communication formats highlighting that BCH patients and families represent a broad spectrum of education levels, learning styles, and primary languages. All communications were developed at a 5th to 6th grade reading comprehension level. However, families recognized that although a patient or parent reads at a certain grade level, there may still be issues with families understanding complex terms or ideas and further explanation may be needed. They noted that while caring for an ill child, a parent or caregiver may be under stress and may or may not be able to retain and use the information they receive. Understanding these needs, two initial formats of written communication were developed.

The first was a short-form graphic poster that highlighted the key tools and behaviors as a quick way for patients and families to receive the key points of the initiative (Figure 4). The second form of communication was a long-form brochure with detailed descriptors of each behavior and tools to serve as a more in-depth introduction to the initiative (Figure 5). A short educational video featuring family members was also developed to be shown on the hospital's educational entertainment video system. The goal of the video is to demonstrate the importance of family members as both active members of their care teams who are critical to ensuring safe care is provided to their children (Figure 6). Although the educational video is currently only available in English, the brochure and poster are available in the top four spoken languages of BCH patients and families; Mandarin, Spanish, English, and Arabic.

The content and layout of each of the materials were developed as part of the continuous feedback loop process with our Family Partners. BCH's Marketing and

Figure 4. Overview Poster for Patients and Families
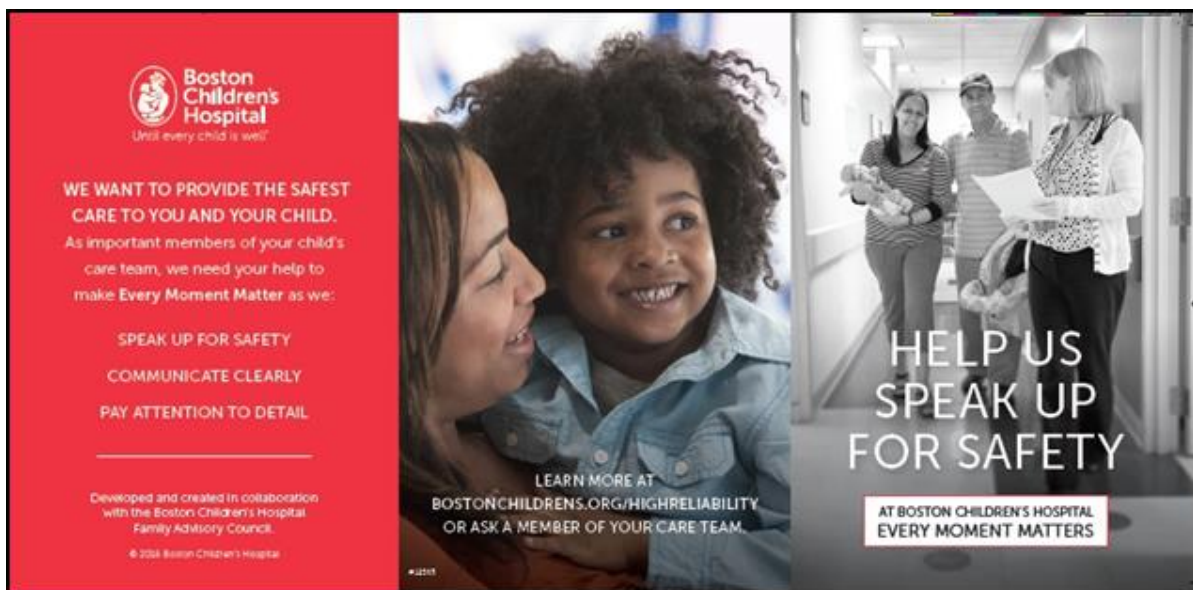

Figure 5. Overview Brochure

Figure 6. Educational Video Overview

> **Segment 1:**
> This segment shows a BCH physician, nurse, and Family Partner who are all working together to ask patients and families to speak up for safety and be active members in their care. The selection of a physician, nurse, and Family Partner was deliberate in order to demonstrate the inclusion of all members in a child's care team.
>
> **Nurse:** Boston Children's Hospital is committed to being a High Reliability Organization.
> **Family Partner:** That means taking action to prevent avoidable errors for all patients, families, staff and visitors.
> **Physician:** Our patients and families are essential to that commitment.
> **Family Partner:** Boston Children's has trained more than 15,000 committed team members in the High Reliability error prevention behaviors and tools.
> **Physician:** And now, we have partnered with patients and families to develop our Patient & Family Error Prevention Toolkit to encourage YOU to be part of our High Reliability team.
> **Nurse:** We recognize that YOU know yourself or your child better than anyone else.
> **Physician:** And we want YOU to know that you are valued members of your care teams.
> **Family Partner:** Here's one mother's story of how she used High Reliability behaviors to be an active part of her daughter's care team.
>
> **Segment 2:**
> This segment interviews a patient's mom who describes a story involving her daughter in which she actively spoke up for safety and participated as a member of her daughter's care team to advocate for her safe care.
>
> **Segment 3:**
> This segment again shows a BCH physician, nurse, and Family Partner who are all working together to ask patients and families to speak up for safety and be active members in their care.
>
> **Family Partner:** We want you to feel comfortable speaking up...
> **Nurse:** Raising concerns...
> **Physician:** And asking questions whenever something does not seem right.
> **Family Partner:** To learn more, ask a member of your care team—that includes anyone who provides care and support for you and your child during your time at Boston Children's.
> **Nurse:** Help us make *every moment matter* at *Boston Children's* Hospital.

Communications team provided expertise in patient and family educational materials, but also actively sought feedback from the Family Partners in order to ensure that the core messaging and concepts of the initiative were clear.

The Family Partners felt that a wide group of learners would be able to receive and retain the information through the selected formats.

The Family Partners periodically presented project updates to the other members of the Family Advisory Council for continued feedback and shaping of the family toolkit. BCH also used a virtual platform for other Family Partners unable to attend the in-person FAC meetings to post updates and ask questions. This proved to be a very valuable method to hear feedback from a much larger group of engaged Family Partners. Finalized in October 2016, the BCH Patient and Family Error Prevention Toolkit is an example of how BCH collaboratively partners with patients and families to create programs and systems that are patient centered.

Results

Since the toolkit was completed in October 2016, Boston Children's Hospital has completed a pilot implementation aimed at introducing the content to staff, patients, and families. Through a formal collaboration with the Office of Experience, focus groups were held with both staff from a selected inpatient medical unit and Family Advisory Council members. The goal of each session was to gather qualitative measurement on perceptions of how a patient or family member may respond to receiving the previously developed brochures, posters, and video. The focus groups helped us to use conventional content analysis to identify themes related to best practices to introduce and reinforce the content.

Themes from the family focus groups demonstrated that the methods in which staff introduced, encouraged, and responded to the initiative was of the utmost importance to its success. Families noted that if staff did not show that they truly felt that patients and families were a part of the care teams through their engagement with the initiative, then they would not feel empowered enough to speak up

when they felt they should. Without encouragement and some education from staff, families would not be able to feel comfortable to truly participate in their child's care. The staff feedback indicated that teams may need education and support in terms of showing how patients and families want to be communicated to and how their communication styles may be received.

After we completed the staff and family focus groups, the Core Team came to the realization that this initiative was more than just safety focused – it was a larger focus of overall patient experience which perfectly aligned with our conceptual model of the high reliability initiative at BCH. With this enhanced focus in mind, it was decided that the primary education roll out should be focused on introducing staff to this concept. This was a significant shift from focusing on how to communicate the initiative to patients and families to making sure involving staff and giving them support to invite patients and families to report occurred first.

To educate staff, the High Reliability Safety Leadership Core Team developed short video based training modules. These videos featured staff and families acting out scenarios developed from focus groups, an external assessment, and Family Partner feedback. The videos depict real life scenarios in which both direct care staff and families felt actually have happened or can happen when families are included in safety. In order to measure efficacy of these modules, pre and post measurement of staff's attitudes and knowledge regarding including patients and families in prevention of harm and reporting will be completed.

In an effort to establish a baseline of how often patients and families are speaking up to report potential or actual

safety events, a mandatory field was added to the BCH Safety Event Reporting System in April 2017. This field asks the reporter of each safety event to identify if a patient or patient's family member notified care teams about the event they are reporting. This reporting system is voluntary and does not capture all of the events in which patients and families may identify, but serves as a starting point for measurement and potential identification of specific safety areas in which patients and families are becoming involved in reducing preventable harm. Over the course of the first year of the field being added to our safety event reporting system, an average of 12% of all reported safety events per month were identified as having a patient or family member notifying the reporting staff member of the safety event.

Next Steps

As we begin to implement this initiative across Boston Children's Hospital, we plan to track selected measures of success to evaluate the efficacy of this tool (Table 3). The primary goal of becoming a High Reliability Organization at BCH is to reduce preventable harm to patients, families, and employees. These metrics have been tracked since the beginning of the High Reliability initiative at BCH and will continue to be monitored to identify any impact from the launch of this patient and family focused initiative.

The next step of the initiative is to launch staff education in conjunction with the implementation of inviting patients and families to partner with Boston Children's Hospital in their care. Clinical areas will develop unique ways in which they feel patients and families can be involved based on their particular setting or patient populations such as improving patient identification or reducing patient falls. Giving families defined tasks or

Table 3. Measures to Be Tracked

Process Measure	Outcome Measure
Family confirmation of completion of educational video	Increase in safety event reporting system events in which parents identified potential or actual events
Staff confirmation of educating family regarding escalation of safety concerns	Reduction in "actual" safety event reporting system events (globally and targeted types based on interventions)
% of staff who complete training curriculum	Improvement in Inpatient Experience Survey questions: • Before giving your child any medicine, how often did providers or other hospital staff check your child's wristband or confirm his/her ID • Providers or other hospital staff tell you how to report concerns about mistakes in your child's health care
AHRQ Culture of Safety Scores	
Press Ganey Patient Experience Scores	

focus to watch for may help in increasing their attention to detail and speaking up

In order to reach this goal, the Core Team will build the support mechanisms for individual areas to launch their specific safety focuses. In the future, BCH plans on continuing the partnership with patients and families to implement the initiative in a variety of settings with the consistent focus of reducing preventable harm.

Conclusions

Our aim was to collaboratively develop a tool that engages patients and families in an effort to reduce preventable harm in a pediatric academic medical center. The engagement of our Family Partners and Family Advisory Council to develop the BCH Patient and Family High Reliability Partnership Initiative has demonstrated that families want to be active participants in helping to promote safe care and prevent errors or harm.

The Boston Children's Hospital High Reliability Safety Leadership Core Team was recognized by the Family Advisory Council in 2016 and 2017 and received the Family Advisory Council Seal of Approval. The purpose of the Family Advisory Council's seal is to identify, acknowledge, and show support for projects that improve an aspect of the patient and family experience and have woven patient and family voices into the process.

Acknowledgement

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