

# Parent Presence during Invasive Procedures and Resuscitation

## Evaluating a Clinical Practice Change

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**Rationale:** Parent presence during invasive procedures and/or resuscitation is a relatively underdeveloped and controversial practice. Much of the concern stems from the apprehension of the medical community.

**Objectives:** To evaluate whether implementation of formal practice guidelines and corresponding interprofessional education would improve clinicians' sense of preparation and comfort in providing parents with options during their children's procedures.

**Methods:** Multiphase pre-post survey of (1) clinician perceptions and (2) practice from the perspective of clinicians and parents experiencing the same procedure. Data were collected over 4 years from a cardiovascular and critical care program in one U.S. children's hospital.

**Measurements and Main Results:** More than 70% of clinicians participated in the perception surveys (n = 782) and 538 clinicians and 274 parents participated in the practice surveys. After the intervention, clinicians reported that parents were present during more invasive procedures and reported higher levels of comfort with the practice of providing options to parents during resuscitative events. Levels of comfort were higher in clinicians who had practiced skills in a simulated learning environment. During both phases, few clinicians reported that parent presence affected their technical performance (4%), therapeutic decision-making (5%), or ability to teach (9%). During the post phase, clinicians reported more active parent behaviors during procedures. Parents who reported receiving information to help them prepare for their children's procedures reported higher levels of procedural understanding and emotional support.

**Conclusions:** Implementation of practice guidelines and interprofessional education had a positive impact on clinicians' perceptions and practice when providing parents with options and support during their children's invasive procedures and/or resuscitation.

**Keywords:** family presence; pediatric intensive care; family-centered care; psychosocial care

Family-centered care has evolved within inpatient facilities over the past quarter-century. It is now well-accepted that pediatric care should be provided within the context of families, with parents considered essential partners in their children's care.

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### AT A GLANCE COMMENTARY

#### Scientific Knowledge on the Subject

Although there is a range of clinician opinion regarding parent presence during a child's invasive procedure and/or resuscitation, little is known about parental perspectives and priorities and what actually occurs in critical care practice. Program-wide interventions to support changes in critical care practice across a wide range of invasive pediatric procedures have not been systemically evaluated.

#### What This Study Adds to the Field

This study investigates the impact of practice guidelines and interprofessional education on clinician perceptions and critical care practice from the perspective of both clinicians and parents experiencing the same procedure. After the intervention, clinicians reported that parents remained at their children's bedside during more invasive procedures. Even with the shift to more invasive procedures, parents reported being well-informed and supported emotionally. This information can assist critical care clinicians, hospital administrators, and policymakers in moving family-centered care into practice.

However, offering parents the option to remain at their children's side during invasive procedures and/or resuscitation remains a controversial practice (1). Although clinician opinion varies widely regarding the appropriateness and logistical feasibility of the practice, parents clearly prefer to have the choice regarding whether to remain present and how best to support their children during these events (2, 3).

Prompted by the endorsement of numerous professional organizations including recommendations of the American Heart Association, in concert with growing public awareness, many pediatric facilities have reexamined their practices and developed formal institutional practice guidelines in support of parent presence during invasive procedures and resuscitation. Few pediatric facilities, however, have conducted clinical education or committed staff resources to adequately support the change in practice (4, 5). Wide unit-to-unit and clinician-to-clinician variations continue to exist within and across pediatric facilities (1).

The current challenge is to design effective interventions that enable organizations to adopt the ethos of parent presence for those parents who choose to remain during invasive procedures and resuscitation. Although there is a range of clinician opinion and conjecture regarding parent presence, little is known about parental perspectives and priorities, about what actually occurs in practice across a wide range of pediatric procedures, and even less about the effectiveness of program-wide interventions to

facilitate changes in clinical practice. The purpose of this study was to evaluate whether the implementation of formal practice guidelines and a corresponding interprofessional educational initiative would improve clinicians' sense of preparation and comfort in providing parents with the option to be present during their children's invasive procedures and/or resuscitation. Additional objectives were to evaluate whether the intervention would provide parents with the information they needed to understand and support their children through procedures, help parents engage with their children during procedures, and increase clinician comfort when providing support to parents.

**METHODS**

A quasi-experimental time series pre-post design was used (Figure 1). Data were collected over 4 years from a convenience sample of interprofessional clinicians and parents across the cardiovascular and critical care programs at Boston Children's Hospital (Boston, MA). Practice disciplines included staff physicians, nurses, and respiratory therapists assigned to the cardiovascular intensive care unit (ICU), medical-surgical ICU, neonatal ICU, and/or step-down cardiac unit. Aside from intensive care fellows, physicians-in-training were excluded because they were not likely to be available throughout the study duration. After consultation with the clinical research compliance officer, the study was deemed a quality improvement initiative designed to improve clinical care to better conform to an established standard and, thus, did not require institutional review board approval.

The intervention included (1) creation and dissemination of practice guidelines, (2) creation of a parent facilitator role and training, and (3) interprofessional staff education.

**Practice Guidelines**

Two guidelines, *Parent Presence during Procedures* and *Parent Presence during Resuscitation*, were drafted by an interprofessional committee of clinical and executive leaders (see the online supplement). The guideline goals were to provide children with familiar parental emotional support and comfort during procedures, and to provide parents with information and support. The guidelines provided information about making the decision to offer parent presence, preparing the parent to be present, determining whether a parent facilitator would be needed, and team and family debriefing. The *Parent Presence during Resuscitation* guideline mirrored the invasive procedure guideline; however, the use of a parent facilitator was required.

**Parent Facilitator Role and Training**

The parent facilitator role was created to maintain the integrity of the therapeutic milieu and to meet the parents' needs for information and emotional support during invasive procedures and resuscitation (see Table 1). Use of a parent facilitator is determined by the bedside nurse

after interprofessional consensus has been reached. The charge nurse designates the parent facilitator from all available staff who have undergone facilitator training.

All members of the nursing leadership group received parent facilitator training during their annual leadership retreat. In addition, all staff physicians, nurses, psychologists, chaplains, social workers, and child life specialists were invited to participate in a half-day Program to Enhance Relational and Communication Skills (PERCS) parent facilitator training workshop, employing high-realism simulation with pediatric mannequins and professional actors portraying parents (6-8). For those unable to attend the workshop, an educational DVD and self-learning packet were made available (9).

**Interprofessional Staff Education**

Interprofessional staff members across the cardiovascular and critical care programs discussed the guidelines during scheduled staff meetings. Educational strategies were individualized by staff champions who adapted a presentation template to include essential elements of family-centered care, key components of each guideline, and the facilitator role and its core competencies. To stimulate open discussion, each presentation also included the unit's and/or disciplinary group's pre data.

**Survey Instruments**

Two survey instruments were adapted from the literature to examine (1) staff attitudes, beliefs, and concerns, and (2) actual practice about parent presence (10-12). The *Clinician Perception Survey* consisted of 10 items identifying the most invasive procedure the clinician had performed as well as the most invasive procedure performed with a parent present within the previous 3 months and sought information conveyed during clinician-parent interaction when the parent remained. Clinicians were also queried about the guidelines, training, and their level of comfort relative to parent presence.

Clinician and parent versions of *Practice Surveys* were administered. The parent version of the practice survey queried parents about clinician activities they found helpful, the extent to which they believed their presence helped their child and themselves, their level of understanding, perceived level of support, and level of comfort with their degree of participation. Parents were also asked whether they would like the option to remain present in the future and whether they would remain for similar procedures. Clinician surveys mirrored the parent survey, but also queried clinicians about the potential impact of parent presence on their technical skill, decision-making, and ability to teach.

Survey questions were answered using yes/no and multiple response categories. The invasive procedures were rank ordered from low to high invasiveness (1 to 14) and categorized by low and high invasiveness by unit-based clinical nurse specialists (Table 2). Clinicians and parents used a 1 (low)-to-10 (high) Likert scale to rate comfort and preparedness. Limited demographic data were collected to ensure participant anonymity. All surveys were pilot-tested for clarity, flow, and content before dissemination.

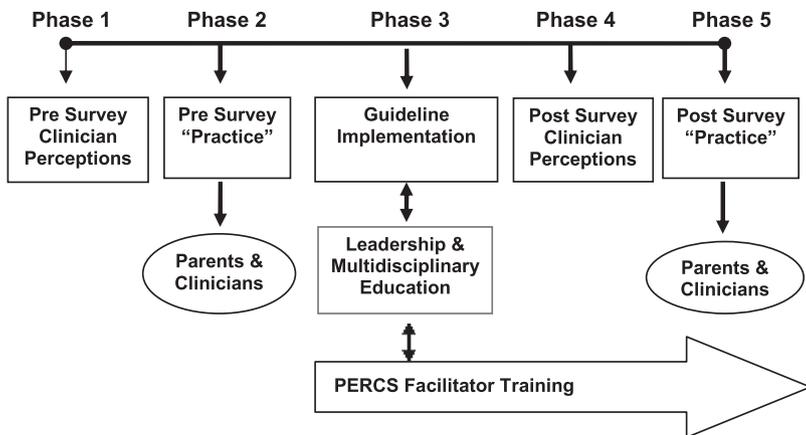


Figure 1. Project timeline and phase descriptions. PERCS = Program to Enhance Relational and Communication Skills.

**TABLE 1. PARENT FACILITATOR ROLE**

- Accompanies the parent to the patient care area, or joins the parent who is already at the bedside. If appropriate, the parent is provided with personal protective equipment and instructed on its use.
- Continually assesses and provides for the parent's physical safety and emotional and spiritual needs. The facilitator will access appropriate services (i.e., translator, chaplaincy, social work, psychology, child life for patient or siblings, and security) through the page operator.
- Provides information to the parent on how best to be present during the event. This may include observation, touching, and talking to child.
- Announces the parent's presence at the bedside to ensure the awareness of the entire health care team, especially when new members join the bedside team.
- Explains to the parent, on the basis of his/her needs and preferences, what to expect and how the health care team interacts and solves problems during a crisis.
- Provides information and support to the parent throughout the event.
- Acknowledges the individual coping and emotional responses of the parent, while continuously assessing the parent's influence on the milieu. If needed, the facilitator creates the opportunity for the parent to leave and return to the bedside as needed and assists the parent to identify his/her tolerance to being present at the event.
- In the event that the parent's behavior is at risk for disrupting the patient's care, the facilitator will identify the disruptive behavior (e.g., loud voice, inappropriate physical contact) and address the concerns with the parent. The facilitator will then supportively define expectations of behavior in order to ensure the best care for the child. If necessary, the facilitator will escort the parent away from the child's room and, if needed, will access security.
- If the parent remains outside the room during the event, the facilitator will assess and accommodate the parent's need and wish for support and review the best method to provide information to the family regarding the event.
- After the invasive procedure or resuscitation, the facilitator will offer the opportunity and help parents to emotionally process the event and, if necessary, make appropriate referrals for follow-up.

### Data Collection

Clinicians' perception surveys were collected for 3 months before and after the intervention phase. Unit/department staff rosters were created and surveys were distributed via intrahospital mail. Cover letters reviewed the purpose of the project and invited clinician participation. Participants were also asked to cross their names off the roster when they had returned the survey or if they declined participation. Reminders were sent every 2 weeks to those who had not crossed their names off the roster.

Clinical practice surveys were collected before and after the intervention phase from parents and clinicians experiencing the same procedure. At least 15 low invasiveness and 15 high invasiveness procedures were collected in each clinical unit per discipline. Parents were invited to participate once within 24 hours of a procedure. Parents under 18 years of age and those who required a medical translator were excluded.

Units were screened twice daily for eligible procedures by one research assistant (RA) who was a critical care nurse released from patient care. Procedures were eligible if one parent was present in the hospital during the procedure. If a parent had been in the hospital, the parent was approached, and if he/she agreed to complete the survey, the RA provided linked surveys to all members of the bedside team who had participated in the procedure. Individual clinician participation was limited to two completed practice surveys per phase. Clinician data were collected for all resuscitation events that occurred during the data collection period, but parents were approached only if their child had survived resuscitation.

### Statistical Methods

Descriptive statistics were calculated. Pre and post responses were compared by the chi-square test for categorical variables or the Wilcoxon rank sum test for continuous variables.

Multiple clinicians comprising the bedside team completed practice surveys for the same procedure. The survey completed by the "owner" of the procedure was selected for inclusion in analyses describing parent activities and or in analyses comparing clinician and parent responses. The "owner" was identified as the clinician responsible for completing the procedure (Table 2). Data from all clinician practice surveys were included in analyses describing the impact of parent presence on their technical skill, therapeutic decision-making, and ability to teach. Parent surveys from both parents were collected from 13 post cases; one survey from each set of parents was randomly selected for inclusion in certain analyses. Data from all parent surveys were included in analyses describing parental perceptions and beliefs. Parent and clinician responses were compared using concordance rates for categorical variables and Spearman correlations for continuous variables.

### RESULTS

More than 70% of clinicians participated in the pre and post perception surveys (n = 782). Table 3 summarizes the disciplinary

affiliation and years in practice. Although there were no significant differences in the invasiveness of procedures clinicians performed, clinicians in the post phase reported that parents were present during more invasive procedures, overall and by discipline (Table 3). Clinicians reported that 14 parents (2%) interfered with procedures, occurring equally across the pre and post sampling periods. Four of those 14 parents were asked to leave the bedside, a situation typically managed by the nursing staff. After the intervention, clinicians reported higher levels of comfort when providing options to parents to be present during resuscitative events, overall and by discipline (Table 3). After the intervention, the majority of clinicians reported feeling prepared to support parents during invasive procedures and resuscitative events (85% of clinicians scored 6 or greater on a 1-to-10 Likert scale).

Higher levels of comfort were reported by clinicians who had the opportunity to attend the PERCS parent facilitator workshops and practice skills in the simulated learning environment (PERCS, 9 [7–10] vs. other training 7 [5–10];  $P < 0.001$ ). Those

**TABLE 2. PROCEDURE LIST RANK ORDERED BY INCREASING INVASIVENESS**

Rank	Procedure
1	Peripheral IV placement/venipuncture*
2	PICC or arterial line insertion*
3	Urinary catheter placement*
4	Nasogastric tube placement*
5	Endotracheal suctioning*
6	Removal of drain, pacer wire, intracardiac line <sup>†</sup>
7	Lumbar puncture <sup>‡</sup>
8	Chest tube removal <sup>†</sup>
9	Endotracheal tube extubation <sup>‡</sup>
10	Endotracheal tube intubation <sup>‡</sup>
11	Central venous line placement <sup>‡</sup>
12	Chest tube placement <sup>‡</sup>
13	Cardiopulmonary resuscitation <sup>‡</sup>
14	ECMO cannulation/decannulation <sup>‡</sup>

*Definition of abbreviations:* ECMO = extracorporeal membrane oxygenation; IV = intravenous; PICC = peripherally inserted central catheter.

Highly invasive procedures identified as greater than 8 in the cardiovascular intensive care unit (ICU) and medical-surgical ICU, greater than 6 in the neonatal ICU, and greater than 5 in the step-down cardiac unit.

\* Procedure "owner": Nurse.

<sup>†</sup> Procedure "owner": Nurse in the cardiovascular ICU or physician in other units.

<sup>‡</sup> Procedure "owner": Physician.

TABLE 3. CLINICIAN PERCEPTION SURVEY

	Pre (n = 384)	Post (n = 398)	P Value
Invasiveness of most invasive procedure during previous 3 mo*	12 (9–14)	12 (9–14)	0.08
Invasiveness of most invasive procedure during previous 3 mo where parent was present*			
Overall†	8 (4–10)	10 (7–13)	<0.001
Physicians	10 (5–12)	13 (10–13)	0.001
Nurses	6 (3–9)	9 (6–13)	<0.001
Respiratory therapists	9 (5–12.5)	10 (9–13)	0.07
First time parent witnessed the procedure, %			
Yes	52	52	<0.001
No	45	25	
Don't know	4	23	
Comfort level with providing option to some parents to be present during a resuscitative event‡			
Overall†	7 (4–9)	8 (5.5–10)	<0.001
Physicians	6 (3–8)	8 (5–10)	0.02
Nurses	7.5 (5–9)	8 (6–10)	0.03
Respiratory therapists	4 (2–6)	5 (3–8)	0.33
Years in practice			
Physicians			
Attending	12.5 (9–17)	12 (9–17)	0.89
Fellow	5 (4–6)	5 (4–6)	0.85
Nurses§			
Level 1	4.5 (2–8)	4 (2–10)	0.66
Level 2 or 3	13.5 (6–20)	10 (7–20)	0.76
APN or NM	19 (16–22)	18.5 (10–22)	0.74
Respiratory therapists	14 (3–16)	18.5 (5–22)	0.051

Definition of abbreviations: APN = advanced practice nurse; NM = nurse manager.

Missing less than 3% of outcomes.

Median (interquartile range) unless otherwise specified.

\*The invasive procedures were rank-ordered from low to high invasiveness (1 to 14) by unit-based clinical nurse specialists (Table 2).

†Overall includes physicians, nurses, respiratory therapists, and others.

‡Clinicians used a 1 (low) to 10 (high) Likert scale to rate comfort level.

§Nursing level reflects registered nurse recognition, where level 1 is competent, level 2 is proficient, and level 3 is expert.

attending the PERCS workshops reported higher levels of preparation to prepare parents to be present, support parents during procedures, and assist parents who were unable to tolerate evolving events.

Clinicians completed 538 (pre, 280; post, 258) practice surveys for 273 procedures/all resuscitations. Table 4 describes the disciplinary distribution of the participants and years in practice. During the post phase, more clinicians reported offering parents the option to stay during all procedures (Table 4) and during highly invasive procedures ( $P < 0.001$ ). During the post phase, clinicians reported that more parents demonstrated active behaviors (e.g., providing physical contact, verbal reassurance, restraint, comforting, holding) during procedures (pre, 38% vs. post, 60%;  $P = 0.006$ ). During low invasive procedures, parents moved closer to their children's bedside (pre, 21% vs. post, 46%;  $P = 0.02$ ) and during high invasive procedures, parents provided more physical contact (pre, 22% vs. post, 43%;  $P = 0.04$ ).

Most clinicians reported that parent presence did not affect their technical performance, therapeutic decision-making, or ability to teach (summary ratings were low in both the pre and post phase (1 [1–1])). Overall, across both phases, parent presence was reported to affect technical performance for 14 (4%) clinicians, therapeutic decision-making for 15 (5%) clinicians, and ability to teach for 24 (9%) clinicians (scored 4 or greater on 1-to-10 Likert scale). Compared with low invasive procedures, parent presence during high invasive procedures was more likely to affect clinicians' technical performance (high, 7% vs. low, 1%;  $P = 0.01$ ) and ability to teach those in training (13 vs. 1%;  $P < 0.001$ ).

During the post phase, clinicians reported parents as calmer and less distraught (Table 4). Across both phases, clinicians reported that the parents' need for information and support were met (9 [8–10]). Regardless of whether parents were present or not, most clinicians would, under future similar circumstances,

provide parents with the option to remain (Table 4). Across both phases, 48 (9%) clinicians, 43 of whom participated in high invasiveness procedures, would not, under similar circumstances, provide the parent with the option to stay again.

Parents completed 274 (pre, 132; post, 142) surveys for 261 procedures/survivor resuscitations conducted on a predominantly young pediatric age group. Seven parents (pre, 4; post, 3) experiencing a variety of procedures across the participating units declined participation. During both the pre and post phases, the majority of parents were offered the option to stay during their children's procedure/resuscitation, and most chose to remain (Table 5). If parents were given the option to stay, they felt more comfortable with their level of participation ( $P < 0.001$ ). Parents reported no pre–post intervention differences in frequency of being offered the option to remain. Parents generally believed their presence helped their children and helped them. In both phases, parents who reported receiving information to help them prepare for their children's procedure reported higher levels of procedural understanding ( $P = 0.04$ ) and emotional support (parent,  $P < 0.001$ ; child,  $P = 0.009$ ). Given similar procedures in the future, most parents reported that they would prefer the option to stay and would stay for the procedure.

During the post phase, 67% of parents had facilitators accompany them during procedures. Facilitators were used during more invasive procedures (facilitator, 7 [4–9] vs. no facilitator, 5 [2–8];  $P = 0.02$ ), and parents reported similar levels of procedural understanding, support, and comfort with their level of participation whether or not facilitators were present. Only one mother who did not have a facilitator during her child's endotracheal tube intubation responded that she would have wanted someone with her during the procedure.

Linked parent and clinician practice surveys were compared for agreement. The concordance rate between parent and clinician

TABLE 4. CLINICIAN PRACTICE SURVEY

	Pre	Post	P Value
"Owner" survey data	n = 137	n = 136	
Invasiveness of procedure*	8 (4–10)	8 (4–10)	0.77
Parent given option to stay, %			
Yes	57	72	<0.001
No	42	19	
Unknown	1	10	
All survey data	n = 280	n = 258	
Parent presence helped infant/child <sup>†</sup>	5 (1–8)	6 (3–10)	0.001
Parent presence helped parent <sup>†</sup>	8 (5–10)	8 (6–9)	0.72
Emotional state of parent <sup>†</sup>	3 (2–6)	2 (1–4)	0.002
Would provide parent with option to stay in the future, %			
Yes	72	84	0.004
No	12	6	
Unsure	16	9	
Years in practice			
Physicians			
Attending	13.5 (8–17)	10.5 (9–17)	0.56
Fellow	4 (4–5)	4 (2–6)	0.57
Nurses <sup>‡</sup>			
Level 1	4 (2–8)	3 (2–5)	0.049
Level 2 or 3	10 (5–18)	9 (6–17)	0.93
APN or NM	16 (10–23)	10 (4–20)	0.09
Respiratory therapists	13.5 (3–17)	5 (1–11)	0.11

Definition of abbreviations: APN = advanced practice nurse; NM = nurse manager.

Missing less than 3% of outcomes, except for parent given option to stay (post, 10% missing) and would provide parent option (pre, 4% missing).

Median (interquartile range) unless otherwise specified.

\*The invasive procedures were rank ordered from low to high invasiveness (1 to 14) by unit-based clinical nurse specialists (Table 2). The median invasiveness was not expected to differ between phases because of the sampling method.

<sup>†</sup> Clinicians used a 1-to-10 Likert scale to rate the extent to which parent presence helped the patient and parent (1, not at all helpful to 10, extremely helpful) and parental emotional state (1, calm to 10, distraught).

<sup>‡</sup> Nursing level reflects registered nurse recognition, where level 1 is competent, level 2 is proficient, and level 3 is expert.

surveys in the provision and receipt of information before a procedure was 70% overall (pre, 66%; post, 72%). Although there was a significant positive correlation between parents' and clinicians' perceptions of whether parent presence helped a child (Spearman  $r = 0.30$ ;  $P < 0.001$ ), none existed for perceptions of whether parent presence helped a parent.

Practice surveys for 35 resuscitation events were completed by 124 clinicians. When compared with other high invasive procedures, clinicians reported parents who remained for resuscitations to be more emotionally upset (resuscitation, 7 [5–8] vs. other high invasive procedure, 3 [1–5];  $P < 0.001$ ). Twenty-five clinicians rated 11 parents as distraught (scored 6 or greater on 1-to-10 Likert scale: pre, 46%; post, 56%) and three of these parents were asked to leave the bedside.

Compared with other high invasive procedures, clinicians reported that parent presence during resuscitations affected their ability to teach those in training (1 [1–3] vs. 1 [1–1];  $P = 0.008$ ). Parent presence was reported to affect the technical performance for 6 (12%) clinicians, therapeutic decision-making for 8 (16%) clinicians, and ability to teach for 11 (24%) clinicians during resuscitations.

Clinicians reported that parent presence during resuscitation was helpful or extremely helpful to few patients (13%) and to more than one-half of parents (57%) (scored 6 or greater on 1-to-10 Likert scale). Across both phases, many clinicians (65%) would, under similar future circumstances, provide parents with the option to remain while one-quarter of clinicians were unsure whether they would provide the option and 10% of clinicians would not provide the option.

Twenty-one parents (pre, 8; post, 13) of 19 children who survived resuscitation attempts completed practice surveys. Nine parents of nine children were given the option to remain during

the resuscitation and seven (78%) stayed. Most ( $n = 16$ , 76%) said they would like the option to stay in the future and more than one-half ( $n = 12$ , 57%) reported that they would stay.

## DISCUSSION

These data suggest a programmatic shift in clinician perspective after the implementation of practice guidelines and interprofessional educational efforts. After the intervention, clinicians reported that parents remained at their children's bedside during more invasive procedures. Although clinicians' perceptions improved after the intervention, there were no significant pre-post differences in the parental perception of the process. Even with the shift to more invasive procedures, parents continued to report being well-informed and supported emotionally. Clinicians also reported a greater degree of comfort in extending the option for parents to remain with their children after the intervention. Parents, however, did not report an increase in the frequency of being offered the option to remain present after the intervention. The discordance between clinician and parent perspectives might possibly be explained in that after the intervention staff members may have been more purposeful and deliberative regarding parent presence.

Consistent with previous research, parents wanted the choice to be able to remain with their children (2, 11, 13). Of those parents who remained, they felt their presence was of help personally and to their children. The finding that not all parents who were invited chose to stay underscores that the decision is individual, and that the option to stay is not right for every parent (14). Comfort with the level of participation during invasive procedures was greatest among those parents who had been offered the option to remain.

TABLE 5. PARENT SURVEY

	Pre	Post	P Value
One-parent survey data	n = 132	n = 129	
Invasiveness of procedure*	7 (4–9.5)	7 (4–10)	0.74
Given option to be present during procedure, %	73	75	0.75
Stayed during procedure, %	80	84	0.42
First time stayed for procedure, %	61	70	0.18
Received information before staying, %	68	75	0.32
All-parent survey data	n = 132	n = 142	
Parent presence helped infant/child <sup>†</sup>	8 (3–10)	8 (5–10)	0.64
Parent presence helped parent <sup>†</sup>	10 (8–10)	10 (7–10)	0.24
Would like option to stay in the future, %			
Yes	88	92	0.42
No	5	4	
Unsure	7	4	
Would stay in the future, %			
Yes	74	72	0.79
No	8	10	
Unsure	18	18	
Demographic information			
Parent's sex, % female	58	60	0.74
Parent's age, yr	33 (27–38)	33 (29–37)	0.92
Child's age, yr	0.3 (0–3.0)	0.4 (0–3.8)	0.81
Number of previous admissions	2 (1–5)	2 (1–4)	0.64

Median (interquartile range) unless otherwise specified.

Missing less than 3% of outcomes.

\*The invasive procedures were rank ordered from low to high invasiveness (1 to 14) by unit-based clinical nurse specialists (Table 2). The median invasiveness was not expected to differ between phases because of the sampling method.

<sup>†</sup>Parents used a 1-to-10 Likert scale to rate the extent to which their presence helped their infant/child and themselves (1, not at all helpful to 10, extremely helpful).

From the clinicians' perspective, parents were more actively engaged at the bedside with their children after the intervention. Parents were also described as calmer and less emotionally upset. The educational initiative might have sensitized clinicians to encourage or notice these parental behaviors, or primed them to expect smoother, more positive interactions at the bedside. The role of the parent facilitator might have also influenced the clinicians' perceptions of parents as more active and calmer when at the bedside during procedures. Reassurance that the facilitator would address parental needs while clinicians attended to the patient may have unburdened staff. Indeed, facilitators were summoned by the team for about two-thirds of procedures, and used more frequently during more invasive procedures when parents' needs for information and support were estimated to be greater. Use of a facilitator may benefit and address the needs of clinical staff more than parents, as the presence of a facilitator did not result in a significant difference in how parents felt. The role of the facilitator and its potential impact on parental experience in other organizations with different interdisciplinary team cultures remain to be explored.

The concern that parents might interfere with procedures fuels, in large part, the controversy over the practice of parent presence (13, 15–18). Our data indicate that interference on the part of parents is real but occurs infrequently, on the order of 2% of the time. This suggests that something transpired to curtail parental behavior that was viewed as disruptive and incompatible with the parents' ability to remain. A clinical approach recommended in the educational sessions was simply to point out to parents that their behavior might compromise the team's clinical ability to concentrate and provide the best care.

The potential impact of parent presence on clinician performance during resuscitation has been a concern (19, 20). The findings suggest that the gradient of procedural invasiveness is important to understand the effect of parent presence on clinicians' self-reported technical performance, clinical decision-making, and ability

to teach. Specifically, clinicians who were responsible for conducting more invasive procedures experienced greater impact on their ability to teach. During resuscitation procedures, the impact of parent presence was arguably too high for some clinicians. Parental wishes and capacity to remain at the bedside notwithstanding, the clinicians' ability to fully perform technical resuscitation skills and exercise clinical decision-making are of paramount importance to uphold the quality of care. This issue is especially salient at academic teaching institutions that are responsible for training clinicians in highly invasive, low-frequency procedures. Espeel has made several recommendations to decrease the potential negative impact of parent presence on physician performance (21). These include the presence of a senior skilled mentor, assigning an experienced nurse or physician to help support parents, and systematic medical and psychological debriefing after resuscitation events.

The simulation-enhanced workshops added educational value and practice opportunities over and above didactic sessions. The PERCS educational paradigm has been demonstrated to increase clinician sense of preparation, confidence, communication, and relational skills, and to decrease anxiety during challenging health care conversations (7, 8). When resources are limited, a self-study packet can be used independently (9). Integrating innovative, experiential educational methods for parent presence training is warranted, particularly where training is part of the mission of the organization.

The strength of this study was the evaluation of a comprehensive program across a large clinical enterprise from the perspectives of parents and clinicians. Study limitations included the potential bias associated with the inability to randomize parents and the potential for secular changes over the study period. Data were collected from a single children's hospital and from parents of primarily young children; thus, transferability may be limited. Changing organizational cultures to adopt the ethos of parent presence during invasive procedures and resuscitation requires

interdisciplinary leadership and a critical mass of support from the entire clinical team. Although the overall response rates were higher than those reported for other surveys used in organizational research (22), we do not know the perceptions of the 27% (pre)/30% (post) of clinicians who did not respond to the perception surveys or the impact of their opinions on this clinical practice change. Medical interns and residents were excluded from participation because they were not likely to be available throughout the study period. Parents who were not on-site during the procedures and parents of nonsurvivors of resuscitation were also excluded. Finally, these data were subject to the limitations associated with the use of self-report instruments.

Future studies are needed to examine the pediatric patient's developmental response to parent presence. Investigation of the perspectives of older, more verbally articulate children who undergo complex invasive procedures would help parents and clinicians gain more insight and skill when providing emotional and psychological support to hospitalized children. The long-term effect of parent presence on parental stress, coping, and bereavement remains an important and active area of investigation (13, 23, 24). Future efforts might also examine whether parent presence impacts clinicians' role satisfaction and retention in acute care environments (25). Further examination is also needed regarding the use, role, and return on investment of additional staff to support parent presence from patient, family, and staff perspectives.

In summary, we evaluated a clinical practice change from the perspectives of clinicians and parents. Implementation of practice guidelines and interprofessional educational initiative had a positive impact on helping clinicians to be better prepared, capable, and more deliberative when providing parents with more options during invasive procedures and resuscitation. The intervention facilitated a cultural shift in the clinical practice of providing parental support during their children's invasive procedures and resuscitation.

**Author disclosures** are available with the text of this article at [www.atsjournals.org](http://www.atsjournals.org).

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