

# Evaluation of the Impact of a Simulation-enhanced Breaking Bad News Workshop in Pediatrics

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**Introduction:** Our goal was to develop and evaluate the effectiveness of a simulation-based workshop for teaching pediatric trainees' communication skills in breaking bad news.

**Methods:** A simulation-based workshop was developed to teach skills in breaking bad news. After a classroom-based introduction, small groups of residents participated in 3 scenarios, each starting with a simulated resuscitation, followed by 2 conversations with the patient's parent, played by actors. Each conversation was observed through a 1-way mirror and was followed by a debriefing. After the workshop, the residents completed workshop evaluations and a self-assessment. Before and after the workshop, residents were evaluated in Objective Structured Clinical Examination stations where they were required to give bad news. Two physician experts and 2 parents who personally experienced receiving bad news about their child evaluated resident performance using a previously validated communication evaluation tool.

**Results:** Residents' ratings of the workshop were very high for all items, and 100% of the residents reported improvement in their ability to deliver bad news after the workshop. Statistically significant improvement was found in 14 of 17 items of the evaluation tool used by experts and parents, with the parents reporting greater improvement than the experts.

**Conclusions:** This reflective, simulation-based workshop successfully improved pediatric trainees' skills in having difficult conversations with families, as evaluated by the participants, by physician experts, and, most importantly, by parents who have experienced these conversations in real life.

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**Key Words:** Breaking bad news, Pediatrics, Simulation, Difficult conversations, Standardized parents

**B**reaking bad news (BBN) to a family in pediatrics can be extremely challenging for physicians,<sup>1–3</sup> with the emotional stress of the event<sup>4</sup> and the potential for long-lasting impact on a family<sup>5</sup> adding to the level of difficulty and stress experienced by trainees and practicing physicians when faced with this task.<sup>6</sup> The importance of this skill is highlighted by findings that the way the news is communicated is highly memorable and has a significant impact on a family's coping and experience going forward.<sup>5</sup> Parents report highly variable experiences of receiving bad news,<sup>7</sup> and details of their experiences are invaluable for guiding physicians to improve skills in this area. Physicians consistently identify a desire and need for further education in the communication of difficult information,<sup>1,2,8,9</sup> and a number of educational programs have been developed to assist pediatric physicians with developing this important skill.<sup>10–13</sup> These programs frequently focus on

meeting the needs of the learners, with consistent findings of improvement in learner self-efficacy and satisfaction.<sup>10,12,13</sup> Far fewer studies have attempted to objectively evaluate changes in learner performance, using physician experts or standardized parents (SPs) as evaluators.<sup>11,14,15</sup> Using SPs to provide both the intervention (through feedback after delivery of BBN to the SP in a pediatric emergency department [ED]) and to measure outcome, emergency medicine residents and fellows were found to have improved self-confidence, better content coverage, and improvements in 2 of 11 measured humanistic skills.<sup>11</sup> Among medical students, improvements were noted after the completion of a BBN training course in all 5 domains measured by a validated BBN assessment scale when evaluated by blinded expert raters but were only found in 2 of 5 domains when rated by unblinded SPs.<sup>14</sup> In a study of primary care physicians, completion of a BBN training program was found to improve scores on a competency-based tool when evaluated using a lengthy, 8-station Observed Standardized Clinical Examination (OSCE), when using SPs as evaluators, compared with controls. Of interest, although these studies all attempted to measure change in performance in BBN skills after an intervention, significant discrepancies were found based on who was evaluating (ie, self-evaluation, SP, or expert rater). The correlation of any of these raters' perceptions with those

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of a parent and thus the impact of these educational programs on the ultimate goal of improving the experience of a real parent remains unknown.

In this study, the impact of a new simulation-based BBN curriculum was assessed in 3 ways as follows: using learner self-assessment, physician expert evaluators, and parents who have had the personal experience of having received bad news concerning their own child.

## METHODS

### Overview

All residents in the general pediatrics and pediatric emergency medicine programs at the University of Calgary were invited to participate in this study. A 5-hour workshop led by physicians and bereavement social workers was developed to teach subjects how to communicate difficult information or “bad news” to parents. The workshop was incorporated into the preexisting residency academic teaching schedule to protect the subjects from clinical and administrative duties and allow full participation. During the course of the study, the workshop was delivered 3 times, with a maximum of 12 subjects participating each time to provide each subject with the opportunity to lead at least 1 conversation with an SP. The principal investigator briefed all SPs before each workshop, providing detailed histories of the parents they were playing and the goals of the workshop. The same actors attended all of the workshops and played the same roles for consistency. Subjects completed both self-assessment questionnaires and workshop evaluations after the workshop to assess their perception of learning and to obtain feedback on the workshop. Physician expert raters and parent raters evaluated the residents giving bad news to an SP as part of a formative OSCE both before and after the workshop to assess the impact of the workshop on performance.

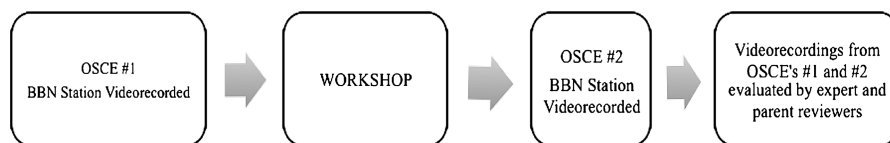
### Participants

There were 39 residents in their second to fifth year of postgraduate pediatric training at the University of Calgary eligible for participation in this study, but 6 were unable to complete all phases of the study because of scheduling. Recruitment occurred during a series of regular academic sessions, and informed consent was obtained from all subjects by the study coordinator. Because of the small numbers and restrictions on when they could participate, we did not track the level of training of the subjects in each workshop or small group. This study was reviewed and approved by the Research Ethics Board at the University of Calgary and funded by an educational grant by the Royal College of Physicians and Surgeons of Canada.

### Workshop

Before each workshop, all subjects were provided with a description of the SPIKES [Setting, Perception, Invitation, Knowledge, Empathy] tool<sup>16</sup> and a workshop agenda, including a summary of the goals of the workshop and the importance of maintaining a supportive, safe, and confidential environment throughout. The 5-hour workshop was divided into 2 halves. The first half was classroom based, beginning with a summary of the literature outlining the

need for training in this area and the paucity of opportunities in the ordinary course of residency to learn these critical skills. Subjects were invited to discuss their own issues and concerns around BBN and dealing with families, and these were used as anchors for further discussion during the workshop. The SPIKES tool was presented, and the subjects were given the opportunity to view examples of “good” and “bad” interviews, both live (acted out by workshop leaders) and video recorded, which were followed by an interactive discussion about what the subjects observed. The social workers then reviewed bereavement literature and discussed the high impact of even brief conversations with families. Subjects were encouraged to reflect further on their own experiences. The second half of the workshop was simulation-based, small group practice of the principles discussed earlier. Each group of 3 or 4 subjects participated in 2 or 3 scenarios, beginning with a 5-minute simulated resuscitation designed to immerse the subjects in the clinical crisis event and then allow them to practice transitioning to having a difficult conversation with an SP. In each simulation, the subject group was given handover from emergency medical service providers who had responded to a 911 call and brought a child into the ED. The group assumed care of the “patient” (an intubatable infant with heart and breath sounds and pulses) with a preceptor leading the resuscitation. Although the subjects were actively involved as team members in the resuscitation, the primary clinical decision maker was the preceptor, ensuring the outcome and sparing the subjects direct responsibility for clinical decision making. The group would continue the resuscitation until one of the subjects was asked to speak to the SP who had arrived in the ED toward the end of the 5 minutes. The rest of the group was brought into an adjoining room to observe this conversation through a 1-way mirror. Each encounter with the SP took approximately 10 minutes, after which the subject joined the rest of the group for a debriefing of approximately 10 minutes. The preceptor facilitated the debriefing, but all subjects were encouraged to reflect on what went well in the conversation and to make suggestions for improvement. Next, the preceptor provided the group with a description of the clinical events that had occurred as the case advanced, and a second subject was asked to speak with the SP for 10 minutes. A second debriefing followed. Subjects were told at the outset that if they found the conversation too difficult they could call a “time-out” and return to their group. At that point, the group would debrief, providing the subject with some suggestions, and the resident could then choose whether to return to the SP and resume the conversation or defer to another member of the group. The actors were highly skilled and able to advance the scenario, start over, and so on, as directed. The cycle then repeated with the next case. Each SP encounter was designed to provide unique challenges; with different information needing to be delivered by the subject and variability of the reaction to the information or “personality” of the SP, each subject would have a different experience in their particular SP encounter. This variability allowed each subject to learn from a variety of situations through the combination of participation in the conversation, observation of other



**FIGURE 1.** Study timeline.

subjects' conversations with SPs, and participation in the group debriefings.

### Scenarios

The 3 scenarios were as follows:

- Near drowning of a 5-month-old that progresses to brain death
- Inflicted brain injury in a 4-month-old with an angry grandparent present for the second encounter
- Traumatic brain injury of a 1-year-old in the context of parental discord

See supplemental digital content (SDC 1, <http://links.lww.com/SIH/A112> Simulation Blueprint and actor scripts) for the details.

### Evaluation

All subjects completed 2 questionnaires at the end of the workshop. The first asked them to rate their skills before and after the workshop, and the second asked them to evaluate various elements of the workshop and to provide written feedback. On other dates, both before and after the workshop, the subjects were videotaped at a 10-station formative OSCE that occurs twice a year in the University of Calgary pediatrics residency program, designed to mirror the certification examination OSCE that residents take at the end of their training. Stations are 15 minutes in length and vary in content, such as giving telephone advice, interpreting tests, and taking detailed histories from parents. The OSCE stations created to evaluate this workshop required subjects to give a new diagnosis of either Down syndrome in an infant or leukemia in a 3-year-old boy to an SP. Two SPs were briefed by the principal investigator for each session, so they could trade off after each interview, allowing them time to recover as they found these encounters emotionally challenging. They were given detailed scripts of their circumstances, thoughts, and feelings for consistency, and these were reviewed with them in detail before each OSCE. The subjects were randomized as to which of the 2 cases they did before and after the workshop, and reviewers were blinded as to which OSCE station was before and after the workshop. The recordings took place over 18 months in 4 different OSCEs to capture all the subjects who attended the workshop with a minimum of 3 and maximum of 6 months between the workshop and the second OSCE because these occurred as part of the normal educational curriculum. This timeline is represented in Figure 1.

All videos were copied and sent to 4 reviewers, 2 "experts," and 2 parents. The expert reviewers were a bereavement social worker and a physician with years of experience in dealing with families and trainees in this context. The parents both had a child diagnosed with a life-defining illness and thus had personal experience. No reviewer knew any of the participants. The reviewers were chosen for

convenience. The communication tool was reviewed with them in advance, so that all reviewers understood the terminology used. They were asked to watch each DVD and evaluate the resident using a published communication process skills tool,<sup>17</sup> with minor modifications made to allow it to be used to assess communication with a parent as opposed to an adult patient.

### Statistical Approach

Dichotomous (yes or no) responses of ability to deliver bad news after the workshop were analyzed by a nonparametric binomial test with a test proportion set at 0.50. Change in perception of abilities before and after the workshop in workshop participants were analyzed by dependent *t* tests. Rater agreements for experts and parents in the assessment of residents' ability to communicate bad news were analyzed using the  $\kappa$  statistic. Finally, a  $2 \times 2$  mixed-design analysis of variance was used to analyze total scores for examiner evaluations of communication skills, with examiner type treated as the between-subjects factor and time treated as the within-subjects factor. For all statistical analyses, the  $\alpha$  level was set to 0.05, and SPSS version 18.0 was used to conduct analyses.

## RESULTS

### Barriers for Residents

During the classroom component of the curriculum, subjects generated a list of their own concerns regarding BBN

**TABLE 1.** Concerns and Barriers Raised by Residents

Lack of medical knowledge
Being unprepared for questions
Fear that parents will ask something we cannot answer
Stress
Fear that we will not be able to deal with the emotions we get back
Unsure how honest to be
Afraid to take away hope
Fear of confrontation
How much information about our own history to share
Concern about crying in front of family
<b>Parental Factors</b>
Cultural differences and expectations
Angry parent
Parents who are not getting along
Parents who disagree with each other
Wailing parent
Parents who want physicians to make the decisions about discontinuing aggressive care and transitioning into comfort care only
<b>Patient Factors</b>
When and what do you tell children?
What if the parents refuse to tell their child the bad news?
Who tells the children?
<b>Institutional Factors</b>
Lack of time
Lack of opportunity to learn the skill

**TABLE 2.** Mean Workshop Evaluation Ratings

	Mean	SD
Presenters		
Enthusiasm	6.18	0.80
Apparent knowledge of the topic	6.32	0.68
Created an environment of respect	6.50	0.66
Encouraged learners to bring up problems or ideas	6.50	0.71
Promoted a nonthreatening environment	6.41	0.82
Promoted productive group dynamics	6.32	0.77
Presentation		
Information was presented in an organized manner	6.24	0.74
Stated objectives/goals clearly	6.15	0.82
Extended principles to where new learning could occur	6.06	0.85
Quality of audiovisual aids/handouts complemented the workshop	6.03	0.80
Content		
Volume and complexity of the information presented was appropriate	6.03	0.76
Related information presented to practical problems	6.41	0.74
Content was relevant to my practice	6.44	0.75
Simulation phase		
Use of Human Patient Simulation to start the session	6.36	0.96
Feedback discussions after simulated interviews	6.48	0.71
Simulated encounters as a method to experience giving bad news	6.64	0.55
My overall rating for this workshop	6.45	0.71
Do you think that your ability to deliver bad news to families will improve as a result of this session?	1.00	0.00

Workshop participants rated each item on a Likert-type scale ranging from 1 (unacceptable) to 7 (outstanding). The final item was scored on a dichotomous scale with 1 (yes) and 2 (no).

to families. The most frequent concerns (raised in at least 2 workshops) are listed in Table 1. Time was allocated to allow group discussion and advice, and experience was shared

by the facilitators to specifically address concerns raised by the subjects and ensure that subjects' perceived learning needs were met.

### Workshop Evaluation

Table 2 reports the means and SDs for all items in the workshop evaluation, illustrating that mean ratings were close to ceiling with strong favorable ratings for all items. The final item of the evaluation asked subjects to indicate (as a dichotomous choice) whether they thought that their ability to deliver bad news to families would improve as a result of the experience. All subjects responded "yes," a result confirmed to be statistically significant ( $P = 0.00$ ) with a non-parametric binomial test with the test proportion set at 0.50.

### Resident Self-Assessment

Table 3 reports means, SDs, and the results of dependent  $t$  tests assessing change in the perception of abilities before and after the workshop. Statistically significant improvement in confidence ratings were found with  $P < 0.009$  for all items.

### Evaluation of Resident Performance

The 2 expert and parent reviewers watched 2 video recordings of each subject communicating bad news to an SP and completed assessments using the process assessment tool. For all analyses, tests were 2-tailed, and the  $\alpha$  level was set at 0.05.

The evaluators rated each communication skill item on a 3-item scale, with 2 indicating a rating of good, 1 indicating adequate, and 0 indicating not done/inadequate. Statistically significant rater agreement was obtained for both the experts and the parents, with a moderate level of agreement for experts ( $\kappa = 0.463$ ,  $P < 0.001$ ) and low level of agreement for parent raters ( $\kappa = 0.144$ ,  $P < 0.001$ ). Table 4 presents the means, SDs, and results of the dependent  $t$  tests for examiner evaluations of the various communication skills before and after the workshop for all raters combined. Statistically significant improvements in communication skills were obtained before and after the workshop ( $P_s < 0.02$ ) in

**TABLE 3.** Mean Confidence Ratings in Ability to Communicate Before (Retrospective) and After the Workshop for Workshop Participants

I feel confident in my ability to ...	Preworkshop Rating (Retrospective)		Postworkshop Rating		
	Mean	SD	Mean	SD	$P$
Break bad news in general	3.26	0.73	4.03	0.32	0.000
Create a supportive environment	3.55	0.62	4.16	0.52	0.000
Reduce or eliminate signs that I am nervous or anxious	2.97	0.95	3.50	0.67	0.001
Use language that is nontechnical and easily understood	3.34	0.70	3.87	0.43	0.000
Adjust the rate and amount of information I provide	3.21	0.66	4.03	0.48	0.000
Listen to parents' concerns	3.90	0.40	4.17	0.46	0.009
Explore a parent's expectations	3.30	0.70	3.87	0.35	0.000
Empathize with a parent	3.77	0.57	4.13	0.51	0.003
Avoid portraying more hope or optimism that I believe exists to deal with the parents' emotions	3.02	0.84	3.69	0.53	0.000
Summarize information in a way that is easy to understand	3.24	0.59	3.90	0.40	0.000
Anticipate possible responses by parents	2.88	0.72	3.68	0.59	0.000
Deal with difficult emotions from families	2.74	0.82	3.82	0.46	0.000
Close the conversation in an appropriate way	3.10	0.79	3.87	0.43	0.000

Residents rated each item on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). A dependent  $t$  test assessed change before and after the workshop.

**TABLE 4.** Mean Examiner Evaluations of Communication Skills Before and After the Workshop Collapsed Across All 4 Examiners

Communication Skills	Preworkshop Rating		Postworkshop Rating		
	Mean	SD	Mean	SD	P
Greets the parent and obtains the parent's and child's name and uses them.	0.89	0.89	1.76	0.54	0.000
Introduces themselves and their role.	1.69	0.50	1.86	0.35	0.001
Explains the nature of the interview.	1.63	0.58	1.76	0.47	NS
Assesses the parent's starting point.	1.49	0.74	1.76	0.57	0.002
Makes it clear that serious/important information is to follow.	1.24	0.84	1.58	0.70	0.000
Uses parent's response to guide the next steps in moving forward.	1.54	0.53	1.83	0.40	0.000
Discovers what other information would help them and responds to this.	1.54	0.58	1.81	0.41	0.000
Gives explanation in an organized manner using "bite-size pieces."	1.43	0.62	1.83	0.40	0.000
Uses clear language and avoids jargon and confusing language.	1.44	0.58	1.69	0.50	0.000
Picks up and responds to parent's nonverbal cues.	1.46	0.63	1.77	0.47	0.000
Allows parent time to react (use of silence), allows for time to think.	1.51	0.65	1.77	0.42	0.000
Encourages parent to contribute reaction, concerns, and feelings and then responds to them.	1.57	0.60	1.61	0.52	NS
Acknowledges parent's concern and feelings as well as values and accepts legitimacy.	1.63	0.58	1.82	0.38	0.003
Uses empathy to communicate appreciation of the parent's feelings or predicament.	1.55	0.58	1.73	0.48	0.001
Demonstrates appropriate nonverbal behavior.	1.71	0.47	1.83	0.37	0.01
Provides support.	1.85	0.36	1.90	0.33	NS
Summarizes at the end with a plan to follow up.	1.29	0.76	1.72	0.52	0.000
Total score	25.30	5.33	27.82	8.33	0.004

A dependent *t* test assessed change preworkshop to postworkshop scores (2, good; 1, adequate; 0, not done/inadequate). NS, not significant.

all but 3 items as follows: explains the nature of the interview, encourages the parent to contribute reaction, and provides support. However, mean preworkshop and postworkshop scores were high for these items and seemed to be close to ceiling values.

Total scores were submitted to a mixed-design analysis of variance with examiner type (expert vs. parent) treated as a between-subjects factor and time (preworkshop vs. postworkshop) treated as a within-subjects factor. A main effect of examiner type ( $F_{1,123} = 5.18, P = 0.03$ ) and a main effect of time ( $F_{1,123} = 8.64, P = 0.004$ ) were obtained. Figure 2 illustrates that examiner evaluation total scores increased from preworkshop to postworkshop and that parents gave higher ratings compared with experts.

Feedback elicited from parent reviewers resulted in reported concerns about the relevance of some of the items on the communication evaluation tool and absence of items they felt to be important.

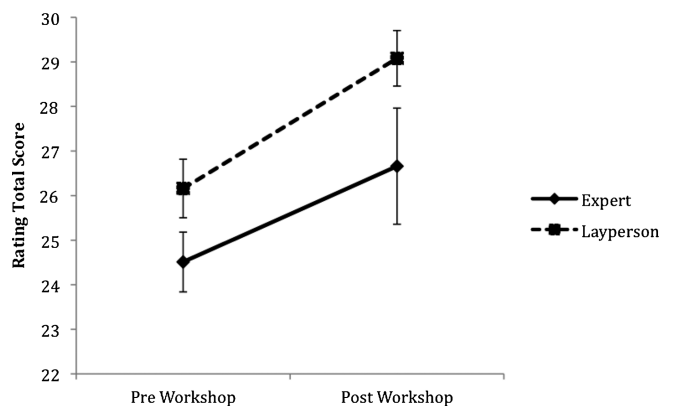
## DISCUSSION

Breaking bad news in pediatrics is an essential skill that is difficult to learn. Fortunately for families, there are few opportunities during the course of pediatric training to discuss catastrophic patient events, but this obligates educators to create opportunities for trainees to learn and practice these critical skills. A growing number of curricula have been published specifically targeting general pediatric and pediatric emergency medicine residents using SPs,<sup>10-12</sup> reflecting an increasing appreciation of the importance of providing realistic practice for the acquisition of this delicate skill.

This workshop shares some common elements with other published programs, including its use of the SPIKES protocol<sup>16,18</sup> to structure the conversations and role playing.<sup>11,12</sup>

The SPIKES tool was chosen after a review of the literature for its ease and applicability to delivering difficult information to patients in general.

There are several features of both the classroom and simulation components that collectively allow this program to provide a unique experience. In the classroom component, the eliciting and incorporation of subjects' concerns as a focus for discussions around BBN uses adult learning theory, matching the program's content with the adult learners' perceived needs, making discussions more poignant to the subjects. This is reflected in the evaluation items "Related information presented to practical problems" and "Content was relevant to my practice," which received some of the highest scores for the classroom phase of the workshop. The involvement of bereavement social workers allows



**FIGURE 2.** Mean total scores for examiner evaluations of communication skills before and after the workshop. Examiners included 2 physician experts and 2 parents with experience with a child experiencing a critical illness or death. Error bars represent SEM.

subjects to understand a parent's perspective<sup>19,20</sup>; how even one sentence can become a crucial part of a narrative moving forward. In the simulation component, subjects were able to experience several important factors that contribute to the challenges experienced when breaking bad news in a clinical setting. Active participation in a patient resuscitation allowed the subjects to become fully immersed in a challenging and stressful clinical scenario and then provide them with an opportunity to learn how to "shift gears" to having a difficult conversation with the patient's family. Although several studies have used SPs for simulated conversations,<sup>1-3,11-13</sup> the use of crisis event simulation as part of the process is rare.<sup>10</sup> The feedback shows that the use of simulation with SPs to learn these skills in general and the use of the initial simulated resuscitation in particular were felt to be effective tools. Not surprisingly, the highest scores on the workshop were for the simulation component of the workshop, which is consistent with other studies.<sup>10,11,18</sup> One subject commented that she "felt this was so real to her that her palms were sweaty and her mouth was dry before she went in the room and remained that way throughout the encounter." Many subjects noted how "real" the experience was for them. This psychological realism is of particular importance in an educational intervention targeting interpersonal communication because it will facilitate the subjects' abilities to apply what they have learned to subsequent clinical encounters requiring this type of communication. All subjects reported that confidence in their skills increased as a result of their participation in the workshop and rated the workshop highly.

Although improved confidence and self-efficacy are important outcomes, they cannot be assumed to correlate with improvements in performance. Most educational interventions lead to improved self-efficacy, but the ultimate objective of any intervention is to improve a competency in a clinically meaningful way. Given that learner self-assessment may correlate poorly with expert evaluation, clinical competence must be objectively assessed to determine the impact of any intervention.<sup>3,21</sup> Although many curricula teaching difficult communication skills have shown high learner satisfaction and improvements in self-efficacy and a small number have used standardized patient feedback to assess subject performance during a workshop,<sup>11,13</sup> a strength of this study is the objective evaluation of the impact of this workshop on clinical interactions with patients and their families through the preintervention and postintervention testing. Routine OSCE stations were used both before and after the workshop to assess the subjects, allowing for the objective assessment of performance in a standardized setting. In our workshop and elsewhere,<sup>22</sup> subjects report that using SPs is realistic for them, thus allowing the OSCE to closely approximate reality for the participant while providing standardization for the purpose of assessment.

In addition to expert evaluators, parents with personal experience receiving bad news about their child were used to provide the perspective that more closely captures the impact that the subject's performance would have on an actual family. Both expert and parent evaluators reported improvement in subject performance after the workshop. Interestingly,

not only did parents report dissatisfaction with the tool, but they also reported more improvement compared with the experts. Several issues may have led to these findings. Parents likely value the emotional aspects of the communication highly, elements such as how compassionate or empathetic the subject appeared, the specific words chosen at a crucial moment, and how the subject responded to the emotional distress of the parent. Given that they may be more likely to formulate an overall impression and pay less attention to the specific items on the evaluation, they may tend to be less accurate in their scoring or biased in their scoring to reflect their overall impression. Because this evaluation tool was not created for and therefore matched to the specific skills and attitudes emphasized in this workshop, stricter adherence to the details of the tool may result in smaller preworkshop-postworkshop score differences, whereas allowing global impression to influence scoring may rate the difference as higher. Using the tool in this way may also explain why interrater reliability was poorer for parent reviewers than for expert reviewers.

### Study Limitations

There are several important limitations to this study that must be considered. The first is the validity of the assessment tool used in this setting. There are very few published communication assessment tools, none in pediatrics in a BBN context, with most of the work thus far being focused on the development of workshops and observational feedback by either educators or SPs involved in the workshops.<sup>18,19,21</sup> The Calgary-Cambridge Process Guide communication skills tool<sup>17</sup> has been validated in the context of the Calgary-Cambridge communications curriculum, which is focused on developing rapport and eliciting information in the context of a general adult patient consultation. Concerns regarding content validity arise because some unique aspects of a BBN encounter are not specifically addressed by this tool, highlighted by the dissatisfaction with the assessment tool reported by the parents. Although there is significant overlap in the approach of the Calgary-Cambridge and the SPIKES curriculum, including a focus on rapport/relationship building, empathy, listening skills, and so on, they remain to be distinct curricula with different ultimate goals. Thus, using an evaluation tool designed for one to evaluate another must be interpreted with caution. Another element of tool validity, the interrater reliability, was lower than expected. This may be due to limited rater training. All of these concerns highlight the need for further research to develop a valid tool for the assessment of performance in delivering bad news and, importantly, for this to be done with the input of parents, who are after all, the ultimate receivers of the bad news.

A second limitation is the lack of a comparison group. This study was conducted at one institution with a relatively small number of subjects, and the authors felt that dividing the subjects into 2 groups to have a comparison group who did not receive the intervention would be problematic for several reasons. First, residents from all levels of training report significant discomfort and a significant paucity of opportunity to practice BBN skills in the course of their regular training, thus reducing the likelihood that observed

benefits were due to skills acquired in the course of their usual residency training. Second, having an intervention group that was only half the size of the current study population would make interpretation of preintervention-postintervention data more difficult. Finally, there was significant interest and enthusiasm in participating in the workshop by all residents because of their perceived low self-efficacy in these skills, and withholding or delaying the opportunity to develop these crucial skills was felt by the authors to be unethical.

Although this study was conducted at one institution, thus limiting the generalizability of the results, the workshop is designed to be reproducible and disseminated to other sites with a larger number of participants. Evaluation data from these workshops will facilitate refinement of the content and format of the workshop and continuation of the process of curriculum development.

## CONCLUSIONS

This novel simulation-based pediatric BBN workshop has provided pediatric trainees with a needs-based, experiential learning curriculum in an area where residents lack clinical opportunities for practice and yet may have a life-altering impact on a family. Although the overwhelmingly positive impact that learners felt this workshop had on their skills is gratifying, the improvement in performance seen by the experts and, more importantly, the parents provides objective evidence of the real impact of this program.

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