A Pediatric Airway “Rotator” Program: A Performance Improvement Initiative

First responders do not frequently encounter pediatric patients with airway issues. Reports suggest that pediatric calls account for 4% to 13% of emergency medical services transports.\(^1\)\(^-\)\(^3\) Of those, even fewer required advanced lifesaving skills, such as bag-mask ventilation and advanced airway maneuvers, which were cited as occurring 0.4% of the time\(^1\) or once every 4 to 5 years.\(^4\) Unfortunately, first responders may not feel confident in their knowledge and skills or may experience stress in these situations because of this infrequency.\(^1\)\(^-\)\(^6\) This was supported in a report by the Institute of Medicine (now called the National Academy of Medicine)\(^7\) that identified limited education program training, infrequent exposure, and provider discomfort as critical barriers to high-quality pediatric care in prehospital settings. This is further compounded by the fact that pediatric training for initial emergency medical services certification is required by only 41% of states, and by less than 67% of states for recertification.\(^8\) Of note, responders who participated in repetition of airway management skills and had high-volume exposure or those who had access to simulation and/or operating room (OR) experience exhibited higher success in intubations in adult patients.\(^9\) This is where we hoped our pediatric airway “rotator” (PAR) program could make a difference by providing both simulation and repetitive experience in the OR.

Over the last 5 years, the demand for hands-on airway management in our pediatric OR has grown to 8 multidisciplinary groups: state troopers, emergency medicine residents and fellows, pediatric intensive care unit nurse practitioners, transport registered nurses, paramedics, pediatric residents, and pediatric lifeline transporters (hospital-based pediatric critical care nurses and physicians). Other than reading a suggested article on pediatric airway management,\(^6\) no standardized prerequisites or objectives were required of the groups.
At baseline, the PARs—up to 6 individuals per day—arrived in the ORs and had immediate, direct patient contact at a most vulnerable time. Several studies have suggested that complications in pediatric airway management by first responders most often arise from oxygen delivery issues (delay/delivery/adjuncts), equipment organization (accessibility/broken equipment/unfamiliarity), and medication administration.\(^5\,10\,11\)

Therefore, to be comprehensive, we were interested in building a PAR program that would standardize learners’ objectives, prerequisites, and overall airway management experience in a mutually beneficial manner by incorporating those complications into our program.

A literature review using PubMed and Cumulative Index to Nursing & Allied Health Literature (CINAHL) Plus with the search words first responders, pediatric, airway management, quality improvement, and airway skills simulation yielded no results specific to this type of experience, nor did postings to various pediatric anesthesia social media sites and blogs. Two pediatric anesthesia departments did respond to an email inquiry regarding how they managed outside PARs. They indicated they required completion of either an online curriculum with a hands-on training session, or a difficult airway curriculum and assigned reading. Because our division offered no universally structured experience for the PARs, the purpose of our pilot was to develop, implement, and evaluate a program to improve the effectiveness of the PARs’ preparedness, communication of their learning needs, and their airway management skills.

### Methods

**Design.** A program evaluation design was used to explore the pediatric airway management experience from how the program participants prepared for being in the OR, as

<table>
<thead>
<tr>
<th>Timing</th>
<th>Actions</th>
</tr>
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<tbody>
<tr>
<td>Preintervention</td>
<td>• Needs assessment surveys to ATs and LGLs</td>
</tr>
<tr>
<td></td>
<td>• PARs’ airway skills assessment</td>
</tr>
<tr>
<td>Intervention</td>
<td>• Prerequisites</td>
</tr>
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<td></td>
<td>• Objectives</td>
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<td></td>
<td>• Simulation</td>
</tr>
<tr>
<td>Postintervention</td>
<td>• Surveys to ATs and PALs</td>
</tr>
<tr>
<td></td>
<td>• PARs’ airway skills assessment</td>
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</table>

Table 1. Three-Pronged Approach to Program Development

Abbreviations: ATs, anesthesia teachers; LGLs, learner group leaders; PARs, pediatric airway “rotators.”

Table 2. Learner Group Leader Needs Assessment Survey

Abbreviation: LMA, laryngeal mask airway.

1. What learner group do you represent?
   a. Registered nurse
   b. Trooper
   c. Pediatric resident
   d. Other:
2. How many days do your learners need to manage airways in the pediatric operating rooms per week/month/year? Please be specific.
3. What prerequisites do your learners need to have before you request that they be scheduled in the pediatric operating rooms?
4. Are your learners required to have Pediatric Advanced Life Support training?
5. Are there hard goals your learners must complete (certain number of airways/intubations/LMAs)? If so, what are they?
6. Is there an age range your learners must provide care for? For instance, 0–2 years, 2–12 years, etc.
7. What are some of the objectives you would like your learners to achieve?
8. Please rank those learning objectives in order of their importance to you.
9. How do you encourage your learners to prepare for their day in the operating room?
10. Please add any other questions/concerns/comments:

Table 3. Anesthesia Teacher Needs Assessment Survey

Abbreviations: CRNA, Certified Registered Nurse Anesthetist; OR, operating room.

1. What is your role in the operating room?
   a. CRNA
   b. Pediatric anesthesiologist
   c. Pediatric anesthesia fellow
2. What information would be helpful for you to know about the airway rotators before they begin to manage your patient’s airway?
3. In your opinion, how well prepared are the airway rotators that you work with in the OR (0 = poor, 10 = excellent)?
4. How would you like the airway rotators to introduce themselves to you?
5. Are there any differences you see among provider groups as far as preparedness/knowledge/skills? If yes, can you describe them?
6. How familiar are you with each provider group’s goals and objectives while in the OR (0 = not at all, 10 = very familiar)?
7. Please list the top 3 (or more) learning goals/objectives you think are the most important for the airway rotators to learn in their time with us.
8. Per your observations, how well overall do the airway rotators manage the pediatric airway (0 = poor, 10 = excellent)?
9. How well would you say the airway rotators communicate their learning needs to you (0 = poor, 10 = excellent)?
10. Please share any comments, questions, concerns or observations—we want to hear from you!
well as the time they spent in the OR. The learner group leaders (LGLs)—those in charge of each group of PARs—the PARs, and the anesthesia teachers were informed that this was part of a pilot program to explore ways to improve the PARs’ airway management experience in the pediatric ORs. An institutional review board waiver was granted from the university, because this study was determined to be a quality improvement project. Responses to the surveys by all groups were voluntary and anonymous. The LGLs and PARs were asked to participate in this pilot program, whereas teaching in the OR was a required part of the job for the anesthesia teachers. All the questions on the forms and surveys used were generated by 5 experienced pediatric anesthesia providers (2 Certified Registered Nurse Anesthetists [CRNAs] and 3 anesthesiologists). These tools were then reviewed for face validity and content validity by 5 other experienced pediatric anesthesia providers (3 CRNAs and 2 anesthesiologists). A 3-pronged approach was developed (Table 1) to improve the OR experience for the PARs. During the preintervention stage (the first prong), to determine what content should be included for the intervention, we sent needs assessment surveys to both the LGLs (n = 8; Table 2) and the anesthesia teachers (n = 55; Table 3). The PARs were not surveyed because we had no knowledge of which individuals would be sent for the experience; they were scheduled throughout the year by the LGLs according to their own work, training, call, and educational commitments.

To obtain baseline information on the airway management skills of the PARs before the intervention, they were treated no differently than prior PARs; they simply showed up as others had done in the past for their OR airway experience. However, this time their airway skills were assessed using a checklist in the OR by the anesthesia teachers when previously this had not occurred. The goal was to identify the PARs’ preparedness, communication, and skills before implementing the intervention.

The second prong—the intervention stage—consisted of the development of prerequisites, objectives, and a simulation experience for the PARs. The content for these 3 interventions was developed based on information obtained from deficiencies identified in the literature such as oxygen delivery issues, equipment organization, and medication administration, as well as anesthesia teachers’ and LGLs’ responses to the needs assessment surveys. These responses identified airway management skills, recognition and treatment of common airway problems, knowledge of pediatric airway anatomy, and the physiology and pharmacology related to the intubation process as being pertinent.

The PARs in the interventional group were asked to complete the prerequisite learning assignments and review the newly established list of universal objectives. The prerequisites included reading a journal article6 and a website article12 on airway management, as well as watching several short videos on bag-mask ventilation, oral and nasal airway insertion, laryngeal mask airway (LMA) insertion, and endotracheal intubation. Included in the list of objectives were setting up appropriate airway equipment and rescue devices, knowledge of the causes of hypoxia/hypoventilation and how to correct them, and demonstration of effective mask

<table>
<thead>
<tr>
<th>Table 4. Project Leader Simulation Checklist for Pediatric Airway “Rotators”</th>
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</thead>
<tbody>
<tr>
<td>Abbreviations: ETCO₂, end-tidal carbon dioxide; ET, endotracheal; LMA, laryngeal mask airway; RSI, rapid sequence induction.</td>
</tr>
</tbody>
</table>

1. Setting up airway equipment (chose appropriate oral/nasal airways, LMA’s, ET tubes, laryngoscope blades, verify suction/Ambu³) |
2. Differentiate causes of hypoxia/hypoventilation |
3. Demonstrate mask ventilation |
4. Discuss what airway obstruction looks like |
5. Verbalize interventions to relieve obstruction |
6. Demonstrate insertion of correctly sized oral and nasal airways |
7. Mask ventilate with those airway adjuncts |
8. Demonstrate LMA insertion |
9. Verbalize measures to verify correct LMA placement (chest rise, fogging, ETCO₂, use stethoscope) |
10. Discuss indications to perform RSI (full stomach, trauma) |
11. Discuss common intubation medications given (etomidate, propofol, succinylcholine, rocuronium) |
12. Identify anatomical landmarks necessary to visualize during direct laryngoscopy (epiglottis, arytenoids, vocal cords) |
13. Demonstrate ET tube insertion |
14. Verbalize measures to verify correct ET tube placement (chest rise, fogging, ETCO₂, use stethoscope) |

Ambu is a brand of bag-valve-mask.
ventilation techniques as well as insertion of oral and nasal airways, LMAs, and endotracheal tubes.

On the morning of the scheduled OR experience, 1 of 3 dedicated anesthesiologists (2 CRNAs, 1 anesthesiologist) led the PARs through airway management skills on an intubatable infant mannequin. Simulation exercises included setting up for airway management with appropriately sized pediatric airway equipment, verifying suction, bag-mask ventilation skills, insertion of oral and nasal airways, LMA insertion, and endotracheal intubation (Table 4), which aligned with the PAR objectives. Throughout the simulation, a discussion took place regarding causes of hypoxia/hypoventilation, indications for rapid sequence intubation, and commonly used medications. After completing the simulation session, the PARs went into an OR with an anesthesia teacher to practice airway management on live pediatric patients. Communications were held in a staff meeting and via email alerting the anesthesia teachers to the implementation of this project. Airway assessment forms were reviewed with the providers, and no concerns were expressed. The anesthesia delivery model at this institution was an anesthesia care team; therefore, more than 1 anesthesia provider was likely to be present in each room. The pediatric CRNA, anesthesiologist, or anesthesia fellow assigned to the OR completed the skills assessment form for the PAR's first and last case of the day.

The third prong of the program development—the postintervention stage—began after the PARs completed simulation. They went into the OR, and their airway skills were evaluated by the anesthesia team in the assigned room for the first and last case of the day. After completion of the pilot, surveys were sent to the PARs (n = 8) who participated and the anesthesia teachers who taught a PAR postintervention (n = 9) to evaluate the new process.

- Setting and Sample. The setting for this project was within the 11 pediatric ORs of a large academic medical center in the mid-Atlantic region from November 2017 to January 2018.

The anesthesia teachers (n = 55) came from a pool of 18 pediatric CRNAs, 31 anesthesiologists, and 6 anesthesia fellows. For this pilot program, PARs from 8 different disciplines made up the convenience sample. Because of LGL scheduling, the PARs were not the same individuals before and after intervention, and the anesthesia teachers did not know who they would be scheduled with until the day before their OR time. The LGLs were those 8 individuals in charge of each group of PARs.

- Data Collection and Analysis. Before the intervention, the LGLs and the anesthesia teachers were contacted via email and asked to complete anonymous needs assessment surveys (see Tables 2 and 3) online via SurveyMonkey over a 2-week period. The surveys included 10 multiple-choice questions exploring the background, goals, preparation, and general experience of the PARs, as well as a few open-ended questions. The results were scored on a scale ranging from 0 (poor) to 10 (excellent). Then, the anesthesia teacher (CRNA, anesthesiologist, or fellow) collected baseline data on airway management skills from the PARs (n = 11) using a 1 (poor) to 5 (excellent) scale. During the intervention stage of implementing prerequisites, objectives, and simulation, no data were collected. After the simulation, the postintervention stage began, and the airway management skills of the PARs (n = 8) were evaluated by the anesthesia teachers with whom they were scheduled. At the end of the 1-month pilot program, 2 postintervention surveys were sent out via SurveyMonkey to evaluate perceived outcomes of the program: 1 to the PARs and the other to those anesthesia teachers who taught a PAR during the pilot period.

The preintervention and postintervention surveys and the PAR airway skills assessment surveys contained questions answered in both Likert-type scale and free text. The means and standard deviations were calculated for Likert-type scale responses, and similar topics were identified and grouped for the free-

<table>
<thead>
<tr>
<th>Objective</th>
<th>Anesthesia teachers (n = 27)</th>
<th>Learner group leaders (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%)</td>
<td>Objective</td>
</tr>
<tr>
<td>Mask ventilation</td>
<td>24 (89)</td>
<td>Airway skills</td>
</tr>
<tr>
<td>Endotracheal tube</td>
<td>19 (70)</td>
<td>Practice bagging</td>
</tr>
<tr>
<td>LMA insertion</td>
<td>12 (44)</td>
<td>LMA insertion</td>
</tr>
<tr>
<td>Recognize and treat common airway/respiratory problems, including hypopnea/apnea, obstruction, laryngospasm</td>
<td>8 (29)</td>
<td>Understand the physiology, pharmacology, and techniques that are all a part of this intubation process</td>
</tr>
<tr>
<td>Know pediatric airway anatomy</td>
<td>6 (22)</td>
<td>Exposure to endotracheal intubation</td>
</tr>
<tr>
<td>Simulation</td>
<td>1 (4)</td>
<td>IV line placement</td>
</tr>
</tbody>
</table>

Table 5. Top Learning Objectives of Anesthesia Teachers versus Pediatric Airway Learner Group Leaders

Abbreviations: IV, intravenous; LMA, laryngeal mask airway.
Results

- **Preintervention Survey Responses.**

  Of the 55 preintervention surveys sent to the anesthesia teachers, 27 (49%) responded: 9 CRNAs (50%), 16 pediatric anesthesiologists (51%), and 2 pediatric anesthesia fellows (33%). Before allowing the PARs to manage the airway, 89% of anesthesia teachers wanted the PARs to communicate their experience level, and 37% wanted to know their goals and objectives. Anesthesia teachers rated their familiarity with the provider groups’ goals and objectives as a mean (SD) of 2.7 (2.5) and the PARs’ preparedness as 3.9 (1.9).

  Overall, the PARs’ pediatric airway management was rated as a mean of 4.2 (1.8), and their communication of learning needs as a mean of 3.0 (2.8). Free-text comments included establishing prerequisites or simulation, a more structured experience, and addressing the no-show PARs (those who did not arrive for the program as expected).

  Five of the 8 LGLs (62%) responded to every question. Of those, only 2 LGLs stated that they required prerequisites of simulation time and an airway management session (unspecified). Mannequin practice, cadaver laboratory, difficult airway course, a 2-week basic anesthesia rotation, and “no prerequisites” were each identified 1 time. The LGLs were also asked if they had hard goals for the OR experience: 3 groups said no, whereas others identified needing 1 live pediatric intubation per year, 1 pediatric mannequin intubation every 3 months, 12 live adult intubations per year, and a minimum of 30 intubations (age/timeframe not specified).

- **Goals and Objectives of Anesthesia Teachers and PALs.**

  Table 5 compares the educational priorities of the anesthesia teachers and LGLs. Both groups ranked bag-mask ventilation high (89% vs 60%). Additionally, LMA insertion (44% and 40%) was deemed important, whereas endotracheal intubation was ranked higher by the anesthesia providers (70%) than by the LGLs (40%). Recognizing and treating common airway/respiratory problems, including hypopnea/apnea, obstruction, laryngospasm, and airway positioning, as well as simulation and pediatric airway anatomy were identified as important by the anesthesia teachers but did not specifically make the list for the LGLs. Likewise, managing the patient before, during, and after intubation; medications used; and intravenous placement were identified as desirable by the LGLs, but not by the anesthesia teachers.

- **Baseline Airway Experience.**

  Baseline skills evaluations were collected during November and December 2017 on 13 PARs. These PARs consisted of 1 paramedic, 1 nurse practitioner, 7 emergency medicine residents, 1 trooper, and 1 pediatric resident. Most (60%) had not managed infant airways, and 1 PAR had 3 to 5 experiences. Additionally, 75% had no experi-

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Table 6. Comparison of Pediatric Airway “Rotator” Skills: Preintervention and Postintervention Mean Scores (standard deviation)

<table>
<thead>
<tr>
<th>Question</th>
<th>Preintervention (n = 11)</th>
<th>Postintervention (n = 8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First case of day</td>
<td>Last case of day</td>
</tr>
<tr>
<td>How appropriately was the PAR set up to manage the airway?</td>
<td>2.7 (1.2)</td>
<td>3.2 (1.3)</td>
</tr>
<tr>
<td>How effectively was the PAR able to mask ventilate?</td>
<td>3.7 (0.4)</td>
<td>3.5 (0.8)</td>
</tr>
<tr>
<td>How effectively did the PAR recognize airway obstruction?</td>
<td>3 (0.5)</td>
<td>3 (0.6)</td>
</tr>
<tr>
<td>How appropriately did the PAR intervene with positioning the patient?</td>
<td>3.3 (1.0)</td>
<td>3 (0.9)</td>
</tr>
<tr>
<td>How appropriately did the PAR intervene with an oral/nasal airway?</td>
<td>3 (1.0)</td>
<td>3 (1.0)</td>
</tr>
<tr>
<td>How smoothly was the PAR able to insert an LMA?</td>
<td>4.3 (0.9)</td>
<td>NA</td>
</tr>
<tr>
<td>How was the PAR’s performance in verifying LMA placement (ie, chest rise, fog, ETCO₂, breath sounds)?</td>
<td>3.7 (1.2)</td>
<td>NA</td>
</tr>
<tr>
<td>If unsuccessful with LMA insertion, how easily was the PAR able to adapt and try again?</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>How smoothly was the PAR able to intubate?</td>
<td>3.2 (1.0)</td>
<td>3.4 (1.1)</td>
</tr>
<tr>
<td>If unsuccessful with ET tube insertion, how easily was the PAR able to adapt and try again?</td>
<td>3.7 (0.5)</td>
<td>3 (0.8)</td>
</tr>
<tr>
<td>How was the PAR’s performance in verifying ET tube placement (ie, chest rise, fog, ETCO₂, breath sounds)?</td>
<td>3.7 (0.9)</td>
<td>3.1 (1.2)</td>
</tr>
</tbody>
</table>

Abbreviations: ETCO₂, end-tidal carbon dioxide; ET, endotracheal; LMA, laryngeal mask airway; NA, not applicable; PAR, pediatric airway “rotator.”

Responses were on a scale of 1 to 5, with 1 = poor, 2 = below average, 3 = average, 4 = above average, 5 = excellent.
ence in children in the 1- to 2-year age range, and 56% had no experience in children older than 2 years.

During the preintervention stage, 13 of 26 PARs (50%) who were scheduled for the OR failed to come for reasons not provided, and a sample size of 11 (2 forms incomplete) was deemed too small to make any statistical inferences. Therefore, means were calculated to show any differences in preintervention and postintervention skills scores between the first and last case of the day. Skills assessment questions included PAR setup for airway management; effectiveness of mask ventilation; recognition and management of airway obstruction; and insertion of airways, LMAs, and endotracheal tubes (Table 6). The preintervention data showed that no LMAs were inserted during the last case and that there was an increase in means between the first and last case for airway setup and intubation.

During the intervention stage, and following an email stating that participants were expected to be present for their OR day, 11 of 19 scheduled PARs (58%) were no-shows. On follow up, these individuals cited work, call, or weather interference. Therefore, 8 PARs completed the interventional phase of the pilot program: 3 troopers, 3 emergency medicine residents, and 2 pediatric residents. Five PARs had managed airways in 3 to 5 infants under 1 year old, and 4 had managed airways in more than 10 patients aged 2 years or older (see Table 6). Data from the postintervention skills assessment of the first and last case (Table 7) showed higher means in all domains except intubations, and no change for oral/nasal airway insertion and attempting to place an LMA a second time. Likewise, when comparing preintervention to postintervention means, all mean scores increased except for LMA insertion, which stayed about the same (4.3 [0.9] vs 4.3 [0.5]).

In the postintervention surveys, 9 anesthesia teachers (2 pediatric CRNAs, 6 anesthesiologists, and 1 fellow) responded that the PAR preparedness, airway management skills, and communication of learning needs all increased (Table 8). Interestingly, only 55% recalled receiving an email with a list of objectives for the PARs, although they all responded in the affirmative that the information sheet on each PAR had been helpful in guiding the learning experience. Sixty-six percent responded that the information sheet had been helpful in identifying their level of experience in pediatric airway management. Comments from the anesthesia teachers indicated that the PARs appeared to be performing at a much higher level than they once did and that “some rotators were better than others; troopers are really good and experienced and gracious.”

• **Program Assessment.** The 8 LGLs were asked to distribute a survey link to the 8 PARs who had participated in the pilot program because we did not have their contact information. Seven of the 8 PARs (2 emergency medicine residents, 4 troopers, and 1 pediatric resident) responded (88%) to the request for program assessment. Their comments were positive and included statements such as “The addition of prerequisite learning materials, rotation expectations, and especially the sim[ulation] session to review technique, med[ication] dosing, and airway equipment was extremely helpful” and “Having clear objectives, prerequisite prepar[ation] material, and simulation practice are useful for preparing rotators to get the most out of the OR day.” On an 11-point Likert-type scale (0 = poor and 10 = excellent), the PARs rated the mean helpfulness of the assigned article on airway management in guiding their learning as 8.1, the videos as 7.8, simulation as 9.6, and the overall experience as a 9.5 (Table 9).

**Discussion**

This pilot project was important for the pediatric anesthesia division and for first responders in our region. Many learner groups require focused airway management for the pediatric population, and a more efficient training process was needed. This pilot program not only was successful in increasing the PARs’ preparedness, communication of learning needs, and airway management skills but also suggested that having a structured program in place is useful.

The literature review and needs

<table>
<thead>
<tr>
<th>Patient age</th>
<th>0</th>
<th>1-2</th>
<th>3-5</th>
<th>5-10</th>
<th>&gt; 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preintervention phase (n = 11)</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Infants &lt; 1 y</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ages 1-2 y</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>&gt; 2 y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Postintervention phase (n = 8)</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Infants &lt; 1 y</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Ages 1-2 y</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 7. Previous Total Airway Management Experience of Pediatric Anesthesia “Rotators”

Some data missing due to incomplete forms (n = 2).
Because there is a high demand for this experience, and it may need to be restructured so that those who are invested are scheduled. Obviously, this no-show rate contributed to our small sample. Other weaknesses in our project revolved around the PARs. We did not have the ability to survey them upfront because we did not know who they would be. Therefore, we recognized that the needs assessment surveys reflected the LGLs, not the PARs. Also, based on scheduling, those PARs in the preintervention group were not the same individuals in the postintervention group.

Last, due to the nature of OR assignments and the number of anesthesia teachers at any given time, bias and inconsistency may have been introduced by including all the anesthesia teachers. For instance, some anesthesia teachers may not let PARs perform rapid sequence intubations or intubate neonates if unfamiliar with their skills; that decision was left to the anesthesia teacher’s discretion. It is possible that standardizing our expectations and teaching with a smaller group may have provided more consistency in OR instruction and allowed us to evaluate interrater reliability.

However, what happened is reflective of what occurs on a day-to-day basis as anesthesia teachers strive to allow the PARs the best experience.

For other departments who are interested in developing a similar program, establishing a list of objectives and prerequisites is important so teachers and learners know the goals. If your department has the capability, simulation was the most well received by our PARs.

For future consideration, but beyond our scope, perhaps outside organizations could establish their own prerequisites and/or objectives on a county, state, or even national level. As for future studies, it may be beneficial to place PARs in ORs with similar procedural cases, with patients of similar age, or with the same anesthesia teachers. It may have yielded richer data if an area was added to the assessment sheets to track every airway managed by a PAR, the patient’s age, type and size of airway device and type of maneuvers used, and so on.

In summary, the results of this pilot are limited to our facility. Our primary goal was achieved because the anesthesia teachers reported that the PARs were more prepared, managed the airway better, and communicated their learning needs better. In addition, the PARs indicated that the objectives, prerequisites, and simulations were helpful. The positive outcomes suggest that it may be beneficial to implement this on a permanent basis in the department, and it may be helpful for other large pediatric teaching facilities who face the same challenges.

**REFERENCES**


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**Table 8.** Teacher-Assessed Aptitude of Pediatric Airway “Rotators” in the Preintervention and Postintervention Stages

<table>
<thead>
<tr>
<th>Ability</th>
<th>Preintervention</th>
<th>Postintervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparedness</td>
<td>3.8</td>
<td>7</td>
</tr>
<tr>
<td>Airway management</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Communication</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

*Mean assessments were made on a scale of 0 to 10, with 0 indicating poor and 10 indicating excellent.*

**Table 9.** Pediatric Airway “Rotator” Program Evaluation in Postintervention Stage

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Perceived helpfulness, mean*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Article</td>
<td>8.1</td>
</tr>
<tr>
<td>Videos</td>
<td>7.8</td>
</tr>
<tr>
<td>Simulation</td>
<td>9.6</td>
</tr>
<tr>
<td>Overall experience</td>
<td>9.5</td>
</tr>
</tbody>
</table>

*Mean assessments of intervention were made on a scale of 0 to 10, with 0 indicating poor, and 10 indicating excellent.*

**Table 8.** Teacher-Assessed Aptitude of Pediatric Airway “Rotators” in the Preintervention and Postintervention Stages

*Mean assessments were made on a scale of 0 to 10, with 0 indicating poor and 10 indicating excellent.*

**Table 9.** Pediatric Airway “Rotator” Program Evaluation in Postintervention Stage

*Mean assessments of intervention were made on a scale of 0 to 10, with 0 indicating poor, and 10 indicating excellent.*


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