

# Just in Time Pediatric Anesthesia Simulation for Anesthesia Residents

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## ABSTRACT

In 2021, a pilot of just-in-time in situ simulations for three basic pediatric anesthesia scenarios were conducted at Riley for new to pediatric anesthesia CA1 residents. The three scenarios were pediatric bronchospasm, laryngospasm, and pediatric septic shock in acute appendicitis. This innovative curriculum change was adopted to better prepare residents to effectively recognize, manage and treat these three conditions.

A 24-question feedback survey was sent to the pilot group of eight anesthesia residents. Seven out of eight responded. 100% of the residents found the sim sessions extremely or moderately useful with 100% agreeing that the ideal timing of the sessions is within the first 2 weeks of their pediatric anesthesia rotation.

The survey findings suggest moving pediatric simulations to Riley increased anesthesia resident confidence to identify and treat the different conditions being simulated. Having the simulations occur in the same hospital decreased schedule conflicts and required less travel time for residents and faculty. In situ simulations are a highly effective way ensure we are training our new anesthesiologists in with content that is immediately applicable to their current rotation, or Just in Time.

## BACKGROUND

- In-situ simulations have been an effective way to decrease the high costs and schedule conflicts otherwise faced when simulations are held in an established simulation center.
- Costs are cut by being able to utilize faculty present at Riley as well as ORs that are available regardless of simulation schedule.
- Having in situ simulations made it convenient for residents to attend by cutting commute time and making it easier to fit into residents' busy schedules.
- It makes knowledge immediately applicable to the current pediatric rotation at Riley.
- Simulation has shown to decrease anesthesia trainee anxiety and increase preparedness leading to improved skills and increased confidence in residents therefore leading to improved patient outcomes.

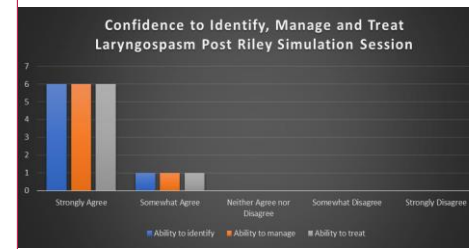
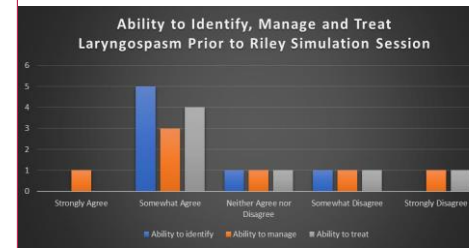
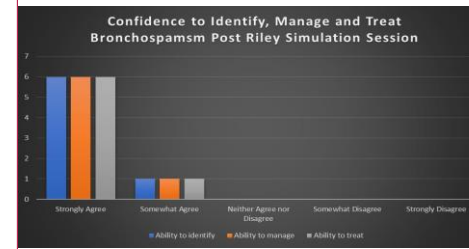
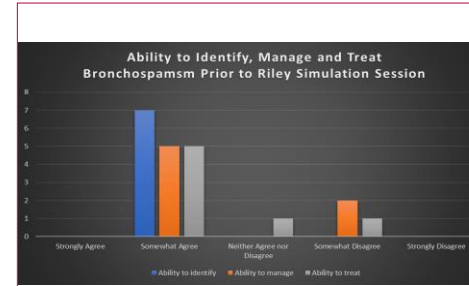
## MATERIALS & METHODS

- Simulation patient designs for bronchospasm, and laryngospasm were created using specific templates that were composed of case information, equipment and supporting objects, simulation scenario set-up, patient background information and baseline simulation state, scenario development states 2, and parameter adjustment form.
- A survey was sent out to 7 anesthesia residents that completed the in-situ sims simulation during the beginning of their Riley pediatric rotation.
- The survey consisted of 24 questions that assessed how prepared the residents felt before and after the simulation in identifying, managing, and treating both intraoperative bronchospasm and laryngospasm.
- Question 2 directly inquired about the best timing for the peds sim sessions in relation to the start of the pediatric rotation.
- One question was open-ended free question that inquired about further steps that could have led to better preparation for the rotation at Riley.

## RESULTS

- 7 trainees responded to all close-ended questions in the feedback survey.
- 29% of trainees responded to the free text question.
- Bronchospasm prior to simulation:**
  - 100% of respondents answered "somewhat agree" to feeling confident at their ability to quickly identify a patient with bronchospasm in the operating room.
  - 71% of respondents answered, "somewhat agree" and 29% answered "somewhat disagree" to feeling confident in their ability to manage intraoperative bronchospasm.
  - 71% of respondents answered, "somewhat agree", 14% answered "neither agree nor disagree", and 15% answered "somewhat disagree" to feeling confident in their ability to treat intraoperative bronchospasm.
- Bronchospasm post simulation:**
  - 86% of respondents answered, "strongly agree", and 14% answered "somewhat agree" to feeling confident at their ability to quickly identify a patient with bronchospasm in the operating room.
  - 86% of respondents answered, "strongly agree", and 14% answered "somewhat agree" to feeling confident in their ability to manage intraoperative bronchospasm.
  - 86% of respondents answered, "strongly agree", and 14% answered "somewhat agree" to feeling confident in their ability to treat intraoperative bronchospasm.
- Laryngospasm prior to simulation:**
  - 70% of respondents answered, "somewhat agree", 15% answered "neither agree nor disagree", and 15% answered "somewhat disagree" to feeling confident in their ability to quickly identify intraoperative bronchospasm.
  - 14% of respondents answered, "strongly agree", 43% answered "somewhat agree", 14% answered "neither agree nor disagree", 14% answered "somewhat disagree", and 14% answered "strongly disagree" to feeling confident in their ability to manage intraoperative bronchospasm.
  - 57% answered "somewhat agree", 14% answered "neither agree nor disagree", 14% answered "somewhat disagree", and 14% answered "strongly disagree" to feeling confident in their ability to treat intraoperative laryngospasm.
- Laryngospasm post simulation:**
  - 86% of respondents answered, "strongly agree", and 14% answered "somewhat agree" to feeling confident at their ability to quickly identify a patient with laryngospasm in the operating room.
  - 86% of respondents answered, "strongly agree", and 14% answered "somewhat agree" to feeling confident in ability to manage intraoperative laryngospasm
  - 86% of respondents answered, "strongly agree", and 14% answered "somewhat agree" to feeling confident in ability to treat intraoperative bronchospasm
- General Feedback:**
  - 14% of respondents stated the ideal timing for the peds sim sessions is on the first day of the rotation.
  - 57% of respondents stated the ideal timing for the peds sim sessions is the first Friday of the rotation (or during the first week).
  - 29% of respondents stated the ideal timing for the peds sim sessions is the second Friday of rotation (or during the second week)

## RESULTS GRAPHS



## RESIDENT FEEDBACK

"The pediatric simulation for new anesthesia residents rotating at Riley was excellent. We were able to practice how to manage important clinical scenarios common to the pediatric population and the timing couldn't have been more perfect. We completed the sim early in the rotation (after the first week) which gave us time to orient to the hospital and develop our workflows. Only days after the simulation, I successfully managed laryngospasm in a patient on my own! Not only were the scenarios very practical but having us complete the sim toward the beginning of the rotation gave us the opportunity to practice what we learned. It was overall a fantastic experience that was conveniently offered at Riley, so no travel was even necessary! 10/10. Would recommend."

-Sara O. Kanoun, DO.

## CONCLUSIONS

Based on the feedback survey responses it is safe to state the in-situ simulation was an effective means to incorporate hands-on learning, increase residents' skills and management abilities, and provide a timely opportunity for newly learned skills to be placed in action.

The survey clearly shows an increase in perceived ability to manage different medical scenarios after in situ sim training. Additionally, timing it to occur during the first few weeks of pediatric rotation allows for increased opportunities to apply knowledge and be better prepared for real-life pediatric anesthesia complications.

Having the simulations occur in situ decreases conflict in schedule as it would require less travel or commute time for residents. In-situ simulations for the training of anesthesia residents is a highly effective way to train our new anesthesia medical professionals.

## REFERENCES

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