

Scenario Overview

Summary

The patient is a two-year-old girl presenting for exploratory laparotomy. During induction, mask ventilation becomes increasingly difficult.

Setting

OR or Simulation Center

Time

Simulation 20-30 minutes

Debrief 20 minutes

Participants

Simulation facilitator

Simulation technician

Anesthesia providers (Anesthesiologist and CRNA)

General surgeon

Circulating RN

Scrub person (Surgical technologist or RN)

Progressive Complexity

Fiberoptic-assisted intubation

Video laryngoscope

Decreased O₂ saturation

Gastric distension

Potential Systems Explored

Roles of perioperative team members

Emergency airway cart

Video laryngoscope (eg, GlideScope®)

Emergency tracheostomy tray and tracheostomy tubes

American Society of Anesthesiologists (ASA) difficult airway algorithm and processes specific to the pediatric patient population

Learning Objectives

Learning Objectives

1. The learner will recognize signs of airway management difficulties in a pediatric patient.
2. The learner will identify when to call an emergency code.
3. The learner will follow the algorithm for managing a difficult airway in a pediatric patient.

Participant Preparation

Pre-simulation

Review the location and contents of the pediatric difficult airway cart, tracheostomy tray, and tracheostomy tubes. Review the practice guidelines and difficult airway algorithm developed by the American Society of Anesthesiologists (ASA). <http://anesthesiology.pubs.asahq.org/article.aspx?articleid=1918684>

Pre-Brief

Today we are going to be simulating an unanticipated difficult tracheal intubation during routine induction of anesthesia on a child. This simulation for practice and learning is a way for perioperative team members to develop their knowledge and skills relative to managing difficult airways in pediatric patients while protecting them from unnecessary risks. It is critically important for the RN circulator to be present and assist the anesthesia professional with intubation. Please treat this scenario as if it were real; administer medications, call for help, retrieve equipment, or give direction in the usual manner. This simulation will be video recorded. If you have not signed a confidentiality waiver, please do so now.

Patient History

Patient is a two-year-old girl who comes to the operating room for an exploratory laparotomy and removal of a Wilms tumor in the right kidney. The parents state that the mass was first noted three weeks ago. They deny any associated pain or changes in eating or elimination patterns. Anesthesia providers did not encounter any intubation challenges during their preoperative assessment.

Allergies

No known drug allergies

Social History

Lives with parents 20 miles outside of the city. Parents are in the family waiting area.

Physical Exam

Weight: 26.5 lb (13.5 kg)
 Vital signs: BP 73/36, HR 100, T 99° F (37.1° C), RR 34, SpO2 100%

Baseline Laboratory Results

	Result	Unit	Reference Range
WBC	6.5	10 ³ /μl	4.0-11.0
RBC	5.5	10 ⁶ /μl	4.6-6.2
HGB	32.2	g/dL	12.0-15.0
HCT	32	%	36-46
PLT	153	cells/μl	140-450
K+	3.5	mEq/L	3.5-5.3
Na+	138	mEq/L	135-145
Cl-	99	mEq/L	95-105

Home Medications

Daily children's multivitamin

Set-up

Room

OR or Simulation Center

Equipment

Patient OR bed
SimChild® or manikin in hospital gown
Identification band on arm
Peripheral IV infusing with solution and catheter appropriate for a two-year-old child
Set up for open pediatric procedure with retractor, Yankauer suction tip and tubing, lap sponges, etc.
Electrosurgical unit
Anesthesia cart and machine
Difficult airway cart
Intubation supplies
Nasogastric tube
Suction canister
Direct laryngoscope
Video laryngoscope

Sequence of Events

The following information should be communicated by the facilitator either verbally, in written format, or via a sign on the door to the simulation room:

The patient is on the OR bed. The room is prepared for the procedure with sterile supplies open, and the scrub person is gowned and gloved at the back table. The nurse anesthetist is masking the patient with 100% oxygen while the anesthesiologist places the IV. The anesthetist is having difficulty ventilating the patient.

Continue with the simulation until the following action/treatments are completed:

Task	Completed	
	Yes	No
Calls for help immediately		
Obtains difficult airway cart		
Obtains tracheostomy tray and tracheostomy tubes		
Delivers supplemental oxygen as possible		
Attempts insertion of airway (eg, laryngeal mask airway)		
Attempts direct laryngoscopy		
Attempts video laryngoscopy		
Secures airway and verifies breath sounds		
Inserts suction catheter to empty stomach, if distension noted		
Discusses safety of continuing procedure		

Confidential Debrief Session

Standardized debrief questions:

- How did the scenario feel, what was your overall impression?
- Did the team collaborate interprofessionally to care for this patient?
- Who was the leader?
- How was that decided?
- Did all members of the OR team realize the critical situation?
- Was there enough help, the right personnel available?
- How were roles clarified?
- How did the communication between team members work?

Difficult Airway: Pediatric Patient-Specific Debrief Questions

- Did the team recognize the airway difficulties?
- Did the team follow the ASA algorithm?
- What did you see happening during this simulation?
- What reactions do you have from what you observed?
- What would you want to assess after the first attempt at intubation?
- What are the take-home messages from the simulation?

Take Home Messages

Reinforce key learning points identified by the learners and how these learning points can be applied to the learners' perioperative practice

Resources

Simulation Video Waiver

TERMS OF AGREEMENT & AUTHORIZATION

I, _____, allow [facility name] to utilize the simulation video in which I participated outside of the class in which it was conducted. This includes, but is not limited to, conferences, college presentations, facilitator training, and other uses.

Resources

Pediatric Difficult Airway Pre/Post Test

1. What are some challenges associated with a pediatric airway?
 - a. Small airway
 - b. Short, large tongue
 - c. Anterior location of the larynx
 - d. Long, narrow, floppy epiglottis
 - e. Narrowest portion of airway is below the glottis, at the level of the cricoid cartilage
 - f. All of the above
2. When the patient's airway is at risk and additional anesthesia providers arrive to assist with securing the airway, the RN circulator should assist the scrub person with obtaining additional supplies for the procedure.
 - a. True
 - b. False
3. The patient's airway has been secured with a laryngeal mask airway, and the surgeon and anesthesiologist determine that it is safe to continue with the scheduled open abdominal procedure. What activities should the perioperative RN expect to occur?
 - a. The surgeon and anesthesiologist will discuss the situation with the parents.
 - b. The surgeon will consult with an otolaryngologist regarding the need for a tracheostomy.
 - c. Both a and b
 - d. Neither a nor b
4. The perioperative RN knows that when multiple attempts are required to secure the patient's airway,
 - a. there could be additional trauma to the airway.
 - b. extubation may be delayed until the patient is able to maintain his or her own airway.
 - c. Both a and b
 - d. Neither a nor b
5. The advantage of using a video laryngoscope compared with a direct laryngoscope is that the video laryngoscope provides an improved view of the patient's airway.
 - a. True
 - b. False

Resources

Pediatric Difficult Airway Test: Answers

1. F
2. B
3. C
4. C
5. A

References for Scenario

Engelhardt T, Weiss M. A child with a difficult airway: what do I do next? *Curr Opin Anaesthesiol.* 2012;25(3):326-332. doi: 10.1097/ACO.0b013e3283532ac4

Sims C, von Ungern-Sternberg BS. The normal and challenging pediatric airway. *Pediatr Anesth.* 2012;22(6):521-526. doi: 10.1111/j.1460-9592.2012.03858.x

Mick NW. The difficult pediatric airway. Up to Date®. 2014. <http://www.uptodate.com/contents/the-difficult-pediatric-airway>. Accessed March 11, 2016.

Acknowledgments

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