PEDIATRIC ASTHMA

VIRTUAL VENTILATOR INCLUDED

Estimated Time: 60 minutes • Debriefing Time: 60 minutes

Scan to Begin

Patient Name: Patrick A. Armstrong

SCENARIO OVERVIEW

Patrick Armstrong is a 16-year-old male patient with known asthma. He called 911 while experiencing an asthma exacerbation that was worsening when he was trying to drive to the Emergency Department. In the Emergency Department, his condition deteriorated and he did not respond to medical treatment, so he was intubated and placed on mechanical ventilation. Students are entering the situation 30 minutes after he was intubated and placed on a ventilator.

State 1 consists of patient and ventilator assessment according to current orders, while also responding therapeutically to the father, who arrives and becomes frantic due to his son's condition. The ARISE Virtual Ventilator is provided in a Ventilator tab for student assessment. In State 2, the patient becomes increasingly agitated. Students should update the provider and request new orders. In State 3, the ARISE Virtual Ventilator alarms. Students should assess the situation, remove the patient from the ventilator, silence the alarms, and ventilate the patient with a resuscitation bag until Respiratory Therapy arrives. In State 4, students receive a video handoff report from the Respiratory Therapist. They should then provide a handoff report to the ICU nurse.

LEARNING OBJECTIVES

1. Integrate evidence-based practice, while using the nursing process, to care for a pediatric patient with asthma on a ventilator
2. Perform a focused respiratory assessment on a patient on a ventilator
3. Safely administer respiratory system medications
4. Effectively utilize therapeutic communication while caring for a pediatric patient experiencing an acute, severe exacerbation of asthma
5. Demonstrate effective interprofessional communication

CURRICULUM MAPPING

WTCS NURSING PROGRAM OUTCOMES

- Implement one's role as a nurse in ways that reflect integrity, responsibility, ethical practices, and an evolving professional identity as a nurse committed to evidence-based practice, caring, advocacy and quality care
- Demonstrate appropriate written, verbal, and nonverbal communication in a variety of clinical contexts
- Integrate social, mathematical, and physical sciences, pharmacology, and pathophysiology in clinical decision making
- Provide patient centered care by utilizing the nursing process across diverse populations and health care settings
- Minimize risk of harm to patients, members of the healthcare team and self through safe individual performance and participation in system effectiveness
- Lead the multidisciplinary health care team to provide effective patient care throughout the lifespan
- Use information and technology to communicate, manage data, mitigate error, and support decision-making

NURSING FUNDAMENTALS

- Maintain a safe, effective care environment for adults of all ages
- Use appropriate communication techniques
- Use the nursing process
- Provide nursing care for patients with alterations in oxygenation
- Adapt nursing practice to meet the needs of diverse patients in a variety of settings

COMPLEX HEALTH ALTERATIONS I

- Evaluate nursing care for patients with chronic alterations in the respiratory system

COMPLEX HEALTH ALTERATIONS II

- Evaluate nursing care for patients with critical/life threatening situations

SIMULATION LEARNING ENVIRONMENT & SET-UP

PATIENT PROFILE

Name: Patrick A. Armstrong

DOB: 11/16/20xx

Age: 16

MR#: 1116

Gender: Male

Height: 177.5 cm (5 ft 11 in)

Weight: 109 kg (240 lbs)

Allergies: NKDA

Admitting Diagnosis: Severe Asthma Attack (J45.50)

Surgical History: None

Code Status: Full code

Ethnicity: African American

Spiritual Practice: Unknown

Primary Language: English

EQUIPMENT/SUPPLIES/SETTINGS

Patient

- Note placement of multiple QR codes for anatomically correct lung sounds.
- He is intubated.

Monitor Settings

- Pulse 72, BP 112/78, RR 12, O2 sat 100%

Ventilator Settings

- Vent settings are: Volume Control, rate = 12, tidal volume = 500, FiO2 = 100 % and PEEP = 7 (Facilitator Note: Settings do not match what was given in report purposefully for discussion about the importance of good inter-professional communication.)

Supplies

- Equipment to obtain vitals including oxygen saturation
- Resuscitation bag and mask
- Phone to call Respiratory Therapy and ICU nurse

Medications (Images of IV labels available by scanning QR codes)

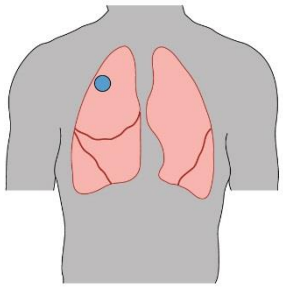
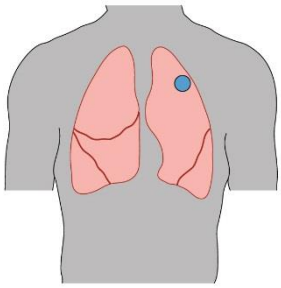
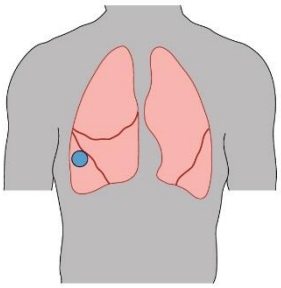
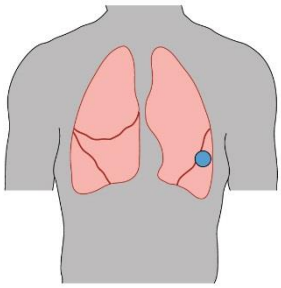
- Terbutaline IV
- Ketamine IV
- Fentanyl IV

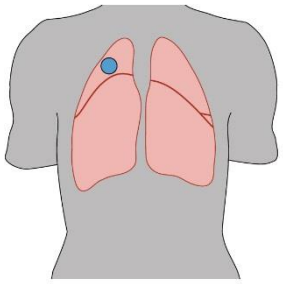
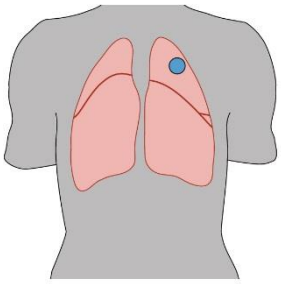
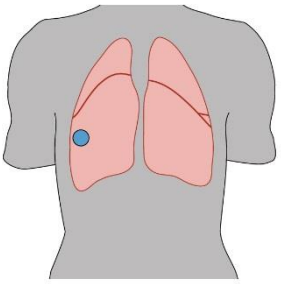
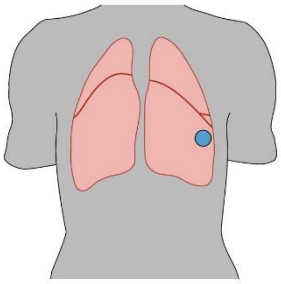
QR CODES

REPORT	PATIENT	PATIENT ID	FAMILY MEMBER
FENTANYL IV	TERBUTALINE IV	KETAMINE IV	RT REPORT
REMOVE VANTILATOR	FACILITATOR		

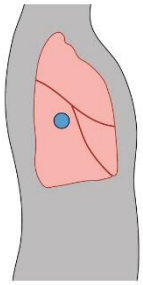
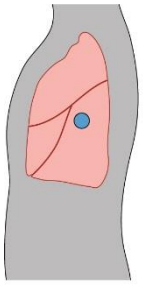
CHEST QR CODES

Cut along the dotted lines to create a folded QR code for each anatomical location. Fold each section along the solid line to create a bi-fold of the diagram and QR code, then apply to the simulator in the appropriate anatomical location.

			
ANTERIOR 2	ANTERIOR 3	ANTERIOR 6	ANTERIOR 7

			
POSTERIOR 0	POSTERIOR 1	POSTERIOR 4	POSTERIOR 5

NURSING | LEVEL: 4V

	
RIGHT AXILLARY 1	LEFT AXILLARY 1

TEACHING PLAN

PREBRIEF

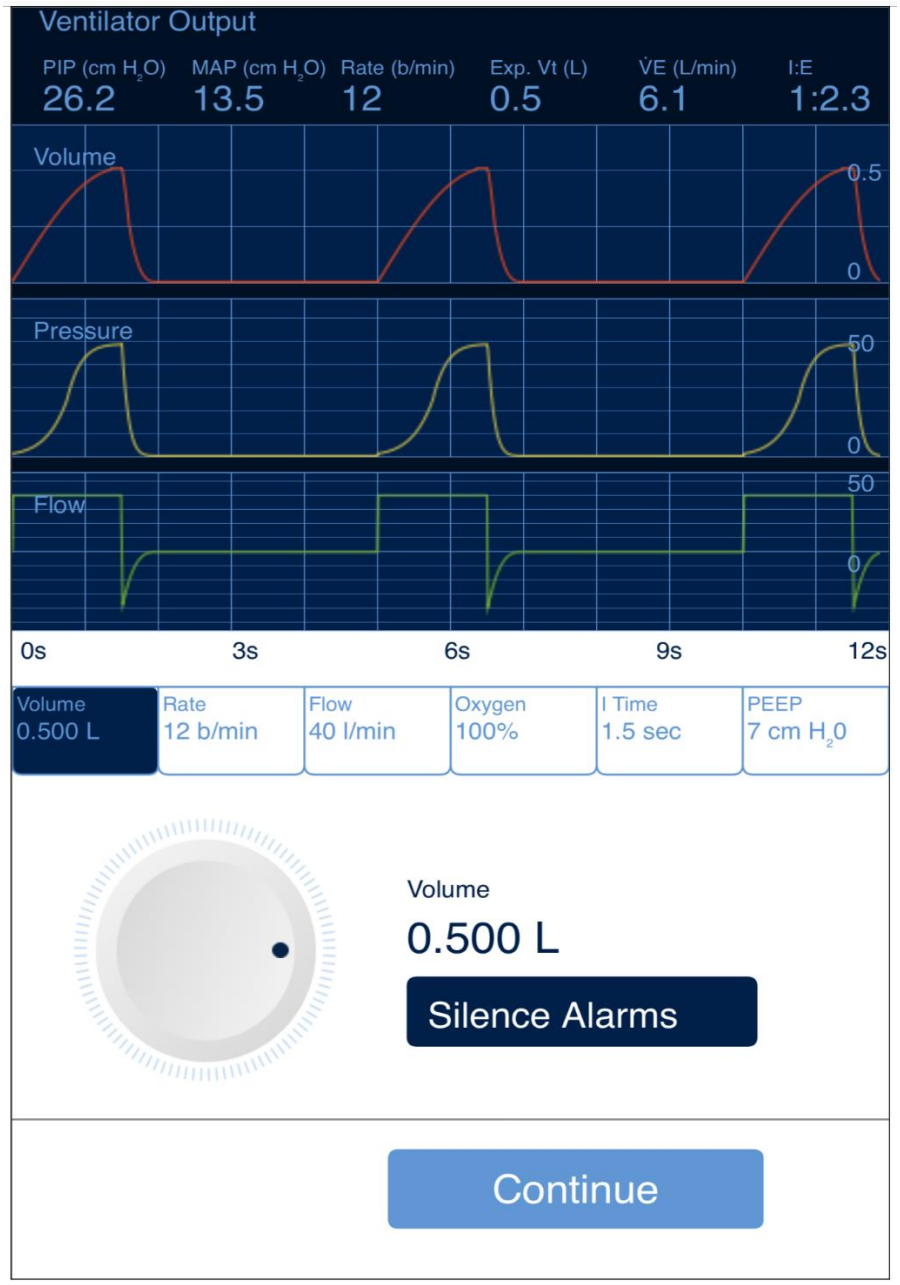
The facilitator should lead this portion of the simulation. The following steps will guide you through Prebrief.

- Scan the **QR code:** "**Scan to Begin**" while students are in Prebrief
- "Meet Your Patient" (on iPad) and explain how the iPad works in the simulated learning environment including:
    - Explain how to use the iPad scanner and QR codes. Remind students that there are multiple QR codes in the simulation, but they should only scan them if they think it will provide data necessary for their assessment and evaluation of the patient.
    - Describe how a QR Code sound will work in the scenario. Show them how to use the ARISE "stethoscope" and the symbol on the QR Code that signifies when a QR Code is audio . Example: **QR Code: Chest**
    - As the facilitator, you should be aware that throughout the simulation some QR codes are necessary to the programming of the iPad content. Directions for which QR codes are required (to be scanned) in each state are listed under each state of the documentation below. The QR codes are also in **BOLD** type.
    - Medication Hyperlinks – All medications are underlined and hyperlinked to DailyMed, which is a medication reference housed by the National Library of Medicine. Students can click on these links during the simulation for up-to-date medication content, labels, and package insert information.
- Discuss the simulation "Learning Objective(s)" (on iPad) as well as any other Prebrief materials
- Get "Report" on iPad
    - Possible Facilitator Questions
        - What important information did you gather from the nursing report that is important to follow up on?
- Play the "Patient" video on iPad
    - Possible Facilitator Questions
        - What are your priorities as you enter the room?

- Review initial tabbed content as a group. Encourage students to organize and prioritize a plan of care for when they enter the room.
    - Review the Sedation Protocol and the Ventilator Order Set together before entering the room

VENTILATOR

The ARISE Virtual Ventilator is located here.



PROTOCOL

See Appendix A for a printable version of the RASS Sedation Protocol

ORDERS

Facilitator Note: The Ventilator Order Set, which includes evidence-based orders to prevent Ventilator Associated Pneumonia, is also available in a printable version in Appendix B

Provider Orders

Date	Time	Order
Today	3 hours ago	Albuterol/Ipratropium nebulizer; may repeat x 3
		Respiratory Therapy consult STAT
		IV Methylprednisolone (1 mg/kg, maximum 125 mg) STAT
		Monitor Vital Signs and Alertness at least every 20 minutes
		Immediately notify MD or call rapid response if signs of impending respiratory failure such as: altered mental status, inability to speak, intercostal retractions, worsening fatigue
		----- James Emerson, M.D.
Today	2 hours ago	Magnesium IV 75 mg/kg, max of 2.5 g administered over 20 minutes, STAT
		ABG STAT
		----- James Emerson, M.D.
Today	1 hour ago	Terbutaline IV infusion at 10 mcg/kg/min
		---- James Emerson, M.D.
Today	30 minutes ago	Rapid Sequence Intubation by RT
		Vent settings: Volume Control, rate of 12, tidal volume of 500, FiO2 100 % and PEEP of 7.
		Continue Terbutaline IV infusion at 10 mcg/kg/min
		Continue Ketamine IV infusion 60mcg/kg/min
		Cardiopulmonary monitoring
		Portable CXR STAT PA and Lateral
		ABG STAT
		STAT Pulmonology Consult
		0.9% NS at 150 ml/hour
		Transfer to ICU when bed available
		----- James Emerson, M.D.
Today	NOW	VENTILATOR ORDER SET *Nursing and Respiratory Care* • Elevate head of bed at 30 degrees or greater • Evaluate need for kinetic bed therapy • Cuff pressure 20-25 cm H_2O

		• Circuit changes: only when visibly soiled or mechanically malfunctioning
		• Humidifiers or moisture exchangers: change only when visibly soiled or mechanically malfunctioning
		• Oral care:
		  ○ Assess oral cavity and lips every 6-8 hours and prn for hydration, lesions, thrush, pressure ulcers, infection
		  ○ Oral care and brush teeth for 1-2 minutes every 6-8 hours with 2% chlorhexidine
		  ○ Apply water-soluble lip balm every 6 -8 hours after oral care to maintain moisture
		• Use a dedicated suction line for endotracheal suctioning of respiratory secretions
		• Rotate position of oral endotracheal tube at least every 24 hours or use ETT holder that takes pressure off mouth
		• Assess patient daily for sedation reduction and readiness to extubate per agency guidelines
		Medications
		• Famotodine 20 mg IV every 12 hours for stress ulcer prophylaxis
		• Enoxaparin 40 mg subq every 24 hours for prophylaxis
		  ○ Notify provider if bleeding occurs
		  ○ Discontinue if platelet levels drop by 50% from baseline

MAR

Medication Administration Record

Scheduled	
Methylprednisolone IVP 109 mg	**Last Given** 2.5 hours ago
Etomidate STAT per RT	**Last Given** 30 minutes ago
Succinylcholine STAT per RT	**Last Given** 30 minutes ago
Famotodine 20 mg IV every 12 hours for stress ulcer prophylaxis	
Enoxaparin 40 mg subq every 24 hours for prophylaxis • Notify provider if bleeding occurs • Discontinue if platelet levels drop by 50% from baseline	
Continuous Infusion	
Intravenous magnesium sulfate (75 mg/kg, maximum 2.5 g administered over 20 minutes) STAT	**Started** 2 hours ago; Ended 1.5 hours ago
Ketamine 60mcg/kg/min	**Started** 30 minutes ago
Terbutaline IV infusion at 10 mcg/kg/min	**Started** 60 minutes ago
PRN	
Albuterol and Ipratropium nebulizer up to three times, every 20 minutes	**Last Given** Today 3.5 hours ago 3 hours ago 2.5 hours ago

VITAL SIGNS

- Screen is open for entry and not verified against any parameters; Patient ID must be scanned before entering vitals.
- Facilitator Note: Simulator settings are: Pulse 72, BP 112/78, RR 12, O2 sat 100%

PROGRESS NOTES

Progress Notes

Date/Time	Note
Today/ 30 minutes ago Respiratory Therapy	Admitted via ER for acute asthma attack. Attempted continuous DuoNeb nebulizer, IV Methylprednisone, IV Magnesium and IV Terbutaline without improvement. Patient developed decreased level of consciousness and ABGs came back with PaO2 58 and PaCO2 44. Notified Dr. Emerson and performed Rapid Sequence Intubation using Etomidate and Succinylcholine. Has a #7.5 ETT secured on the right with a Hollister, 23 at the teeth. Vent settings are Volume Control, rate of 12, tidal volume of 500, FiO2 100 % and PEEP of 7. Still receiving IV Terbutaline infusion at 10 mcg/kg/min and Ketamine 60mcg/kg/min. Continues to have scattered wheezing through upper lobes. --- Randy Thibideau, RRT
Today/30 minutes ago ED Provider	Was informed by Respiratory Therapist that patient condition declining. Was intubated and placed on ventilator by R/T. Continue IV Terbulatine and Ketamine. Awaiting bed to transfer to ICU. Ordered pulmonology consult STAT. ---- James Emerson, M.D.

LABS-DIAGNOSTICS

CBC with Differential					
	On admission			Units	Reference Range
WBC	**11.8**			$x10^3uL$	F: 4.7-10.3/M: 4.5-10.5
RBC	4.8			$x10^6uL$	F: 4.0-4.9/M: 4.0-4.9
Hgb	12.6			g/dL	F:10.9-13.3/M:11.0-13.3
HCT	38.6			%	F: 33.0-39.6/M: 32.7-39.3

MCV	78.7			fL	F: 78.5-90.4/M: 76.5-90.6
MCH	28			pg	25-33
MCHC	34			g/dL	31-37
RDW	13.1			%	F: 11.6-13.4/M: 12.0-14.0
Platelet	309			x10⁹uL	F: 183-368/M: 194-364
MPV	9.8			7.4-10.4	7.4-10.4
Neutro	**70**			38-68	38-68
Lymph	**22**			25-54	25-54
Mono	0.1			0-0.8	0-0.8
Eos	**8**			1-5	1-5
Baso	0			0-2	0-2

ABG Results

	Today 60 minutes ago on NRB 100%	Today Now On Ventilator	Units	Reference Range
pH	7.22	7.37		7.35-7.45
$PaCO_2$	72	44	mmHg	35-45
PaO_2	140	98	mmHg	80-100
HCO_3	26	26	mmol/L	22-26
Base Excess	1.7	1.5	mmol/L	0+/-3
SaO_2	92%	100%		

IMAGING

Imaging Report

DESCRIPTION: Portable x-ray post-intubation for asthma exacerbation.

EXAM: Portable AP chest

REASON FOR EXAM: Intubation

COMPARISON EXAM: None

TECHNIQUE: 1.5 mAS @ 125 kvp

DISCUSSION: The heart and vasculature are normal. Trachea is midline with the endotracheal tube positioned 1 cm above the carina. All visualized bony structures are unremarkable. Costophrenic angles are clear with some mild to moderate flattening of the diaphragm noted. Lung tissue is remarkable for mild to moderate hyperinflation. No infiltrates or atelectasis.

IMPRESSION: Endotracheal tube is located 1 cm above the carina. Flattened diaphragm and hyperinflation consistent with obstructive lung disorder. Clinical correlation suggested.

PATIENT EDUCATION

A patient education handout entitled "Managing Your Asthma" is available. See Appendix C for a printable version of the handout.

LEVEL

The State is displayed

SCANNER

Students use this tab to scan various QR codes within the scenario

EXIT

The iPad reads, "Are you sure you want to exit? All data will be lost."

If "No" is selected, the iPad will return to the tabbed content.

If "Yes" is selected, the iPad will let the student(s) exit and prompt them to complete an embedded 3-5 minute survey.

STATE 1

PATIENT ASSESSMENT

- Patient Overview
    - Patient is sedated, intubated, and on a mechanical ventilator. Patient is displaying slightly agitated movements as students enter room. A **QR Code: Family Member** can be scanned at any time to play a video of the arrival of the patient's father.
- Expected Student Behaviors
    - Introduce themselves to the patient
    - Verify patient identity by scanning **QR code: Patient ID** on armband and comparing to the chart
    - Perform a focused respiratory physical assessment by scanning **QR codes: Chest** at various anatomical locations on the simulator's anterior, medial and posterior chest. (Facilitator Note: Students will find wheezing in the upper and medial bilateral lobes.)
    - Using the ARISE Virtual Ventilator located in the Ventilator tab, assess the ventilator settings and compare to current orders
    - Scan **QR Code: Family Member** at facilitator's direction to simulate the arrival of the patient's father. Communicate therapeutically regarding his concerns.
    - Notify the provider of increasing agitation using SBAR format
- Technician Prompts
    - Overview: Patient is sedated but occasionally moving arm as if trying to pull at his endotracheal tube.
    - If acting as the father:
        - "Why is Patrick on this machine?"
        - "Is he in a coma? Why can't he talk to me?"
        - "Is he dying?"
        - "He's moving around like he's in pain. Can you do something?"
        - "I couldn't leave work so I told him to go to the Emergency Department. I should have just left and picked him up."

        - "How long will he be on this machine?"

- Possible Facilitator Questions
    - What should the nurse assess when a patient is on a ventilator?
    - What is the Respiratory Therapist's role when a patient is on a ventilator?
    - What do the settings mean on the ventilator? Tidal volume? PEEP? FiO2?
    - What complications can occur when a patient is on a ventilator?
    - How can these complications be prevented?
    - How should we explain the ventilator and other equipment to concerned family members?
    - How should sedation be managed when a patient in on a ventilator?
- Tabbed iPad Prompts & Content Changes
    - The scenario will progress to State 2 when **QR Code: Facilitator** is scanned indicating satisfactory assessment has been completed and provider has been notified of increasing agitation

STATE 2

NEW ORDERS

- Overview
    - Students implement new orders that were received when they notified the provider. After students scan **QR Code: Fentanyl IV**, a 2-minute timer begins that triggers the ARISE Virtual Ventilator to alarm. Students will need to address the alarm, bag the patient, and call Respiratory Therapy.
- Expected Student Behaviors
    - Administer new order and scan **QR Code: Fentanyl** to indicate medication was administered. (Note: **QR Code: Patient ID** must be scanned before administering medication.) Students should titrate the dose according to patient's level of sedation using the RASS protocol provided.
    - Continually evaluate patient response to interventions and for signs of worsening condition
    - When ventilator alarm sounds from iPad, assess for causes of alarm by analyzing the ARISE Virtual Ventilator. Facilitator Note: The Peak Inspiratory Pressure (PIP) located at the top left of the ARISE Virtual Ventilator is "red" indicating that is this is the issue.
        - Students have a couple of options at this time:
            - Students should have a team member call Respiratory therapy STAT
            - The alarm can be silenced by tapping the "Silence Alarm" button on the ARISE Virtual Ventilator. The ventilator will re-alarm every two minutes until the button is pressed again.
                - Facilitator Note: The ARISE Virtual Ventilator flashes red indicating that it is in an alarm state at all times – even when the alarm is silenced.
            - Students should remove the patient from the ventilator and ventilate the patient using a resuscitation bag. When students do this, go back to the tabbed content and scan **QR Code: Remove Ventilator**.

        - Facilitator Note: The ARISE Virtual Ventilator will stop alarming when students exit to tabbed content area.
        - After the code is scanned, the look of the ventilator will change and all number will be zeros. The ventilator will continue to alarm unless the "Silence Alarm" button is pressed every two minutes.
    - When the Respiratory Therapist arrives to assess the situation, scan **QR Code: Facilitator** to advance to State 3.

- Technician Prompts
    - Overview: Patient is sedated. Vital signs should start deteriorating once the ventilator alarm sounds, with O2 sats dropping into the 70s, until students use the Resuscitation bag properly and then O2 sats increase into the 80s.
        - Someone may role play father in room who becomes very concerned about patient's status
            - "What's going on?"
            - "Why isn't the ventilator working?"
            - "Is he dying?"
            - The facilitator should direct if the "father" is in the way of treatment or not.
        - When students call for Respiratory Therapist:
            - Students should use SBAR format to quickly explain the situation; if not, ask appropriate questions.
- Possible Facilitator Questions
    - What are common causes of ventilator alarms?
    - What can be done until Respiratory Therapy arrives?
    - How should the Resuscitation bag be used for this patient?
    - How should the family member in the room be managed during an acute situation?
- Tabbed iPad Prompts & Content Changes

- The scenario advances to Level 3 when the **QR Code: Facilitator** is scanned.

ORDERS

Provider Orders

Date	Time	Order
Today	3 hours ago	Albuterol/Ipratropium nebulizer; may repeat x 3
		Respiratory Therapy consult STAT
		IV Methylprednisolone (1 mg/kg, maximum 125 mg) STAT
		Monitor Vital Signs and Alertness at least every 20 minutes
		Immediately notify MD or call rapid response if signs of impending respiratory failure such as: altered mental status, inability to speak, intercostal retractions, worsening fatigue
		----- James Emerson, M.D.
Today	2 hours ago	Magnesium IV 75 mg/kg, max of 2.5 g administered over 20 minutes, STAT
		ABG STAT
		----- James Emerson, M.D.
Today	1 hour ago	Terbutaline IV infusion at 10 mcg/kg/min
		---- James Emerson, M.D.
Today	60 minutes ago	Rapid Sequence Intubation by RT
		Vent settings: Volume Control, rate of 12, tidal volume of 500, FiO2 100 % and PEEP of 7.
		Continue Terbutaline IV infusion at 10 mcg/kg/min
		Continue Ketamine IV infusion 60mcg/kg/min
		Cardiopulmonary monitoring
		Portable CXR STAT PA and Lateral
		ABG STAT
		STAT Pulmonology Consult
		0.9% NS at 150 ml/hour
		Transfer to ICU when bed available
		----- James Emerson, M.D.
		VENTILATOR ORDER SET

		Nursing and Respiratory Care
		• Elevate head of bed at 30 degrees or greater
		• Evaluate need for kinetic bed therapy
		• Cuff pressure 20-25 cm H_2O
		• Circuit changes: only when visibly soiled or mechanically malfunctioning
		• Humidifiers or moisture exchangers: change only when visibly soiled or mechanically malfunctioning
		• Oral care:
		  ○ Assess oral cavity and lips every 6-8 hours and prn for hydration, lesions, thrush, pressure ulcers, infection
		  ○ Oral care and brush teeth for 1-2 minutes every 6-8 hours with 2% chlorhexidine
		  ○ Apply water-soluble lip balm every 6 -8 hours after oral care to maintain moisture
		• Use a dedicated suction line for endotracheal suctioning of respiratory secretions
		• Rotate position of oral endotracheal tube at least every 24 hours or use ETT holder that takes pressure off mouth
		• Assess patient daily for sedation reduction and readiness to extubate per agency guidelines
		Medications
		• Famotodine 20 mg IV every 12 hours for stress ulcer prophylaxis
		• Enoxaparin 40 mg subq every 24 hours for prophylaxis
		  ○ Notify provider if bleeding occurs
		  ○ Discontinue if platelet levels drop by 50% from baseline

Today	Now	Titrate Fentanyl 1-3 mcg/kg/hr IV infusion (max 200 mcg/hr) to maintain patient sedation between 0 and -3 on RASS scale. • Respiratory therapy will initiate Sedation Interruption Protocol when patient condition is appropriate
		Discontinue Ketamine IV infusion
		----- James Emerson, M.D.

MAR

Medication Administration Record

Scheduled	
Methylprednisolone IVP 109 mg	**Last Given** 3 hours ago
Etomidate STAT per RT	60 minutes ago
Succinylcholine STAT per RT	60 minutes ago
Famotodine 20 mg IV every 12 hours for stress ulcer prophylaxis	
Enoxaparin 40 mg subq every 24 hours for prophylaxis • Notify provider if bleeding occurs • Discontinue if platelet levels drop by 50% from baseline	
Continuous Infusion	
Terbutaline IV infusion at 10 mcg/kg/min	Started 60 minutes ago
Fentanyl 1-3 mcg/kg/hour IV infusion (max dose 200 mcg/hr) • Titrate to maintain patient sedation from 0 to -3 on RASS scale • Discontinue per RT when Sedation Interruption Protocol initiated	
PRN	
Albuterol and Ipratropium nebulizer up to three times, every 20 minutes	**Last Given** Today 4 hours ago 3.5 hours ago 3 hours ago

Discontinued		
Intravenous magnesium sulfate (75 mg/kg, maximum 2.5 g administered over 20 minutes) STAT	Discontinued Today 2 hours ago	Last Given 2 hours ago
Ketamine 60mcg/kg/min	Discontinued Today 5 minutes ago	Last Given 5 minutes ago

PROGRESS NOTES

Date/Time	Note
Today/ 60 minutes ago Respiratory Therapy	Admitted via ER for acute asthma attack. Attempted continuous DuoNeb nebulizer, IV Methylprednisone, IV Magnesium and IV Terbutaline without improvement. Patient developed decreased level of consciousness and ABGs came back with PaO2 58 and PaCO2 44. Notified Dr. Emerson and performed Rapid Sequence Intubation using Etomidate and Succinylcholine. Has a #7.5 ETT secured on the right with a Hollister, 23 at the teeth. Vent settings are Volume Control, rate of 12, tidal volume of 500, FiO2 100 % and PEEP of 7. Still receiving IV Terbutaline infusion at 10 mcg/kg/min and Ketamine 60mcg/kg/min. Continues to have scattered wheezing through upper lobes. --- Randy Thibideau, RRT
Today/60 minutes ago ED Provider	Was informed by Respiratory Therapist that patient condition declining. Was intubated and placed on ventilator by RT. Continue IV Terbulatine and Ketamine. Awaiting bed to transfer to ICU. Ordered pulmonology consult STAT. ---- James Emerson, M.D.
Today/ Now ED Provider	Patient becoming agitated at +2 as trying to remove ETT in nonpurposeful manner. Ketamine discontinued and IV Fentanyl started with goal to maintain sedation between 0 and -3 on RASS scale. RT to initiate Sedation Interruption protocol when appropriate. Initiate transfer to ICU bed. ---- James Emerson, M.D.

STATE 3

RESPIRATORY THERAPIST GIVES REPORT

- Overview
    - A "timeout" in the scenario should be implemented, and it should be stated to students that the respiratory therapist arrived, adjusted the ET tube and restarted the ventilator. Students can assess the ventilator using the ARISE Virtual Ventilator in the Ventilator tab. At the beginning of this state, students view a video of the Respiratory Therapist giving them a report after these interventions have occurred. Following report, a message appears: "ICU nurse left a message to call him. Please provide handoff report."
- Expected Student Behaviors
    - Call ICU Nurse and provide a handoff report
    - Prepare patient for transport to ICU
    - Scan **QR Code: Facilitator** to indicate report has been given to ICU nurse and patient is ready to be transported
- Technician Prompts
    - Overview: Patient is sedated.
    - If role playing the father, possible responses include:
        - "How long will he be in ICU?"
        - "When will he be awake so I can talk to him?"
    - When students call the ICU Nurse, they should use SBAR format and include all pertinent information. Ask questions if information is not included.
- Possible Facilitator Questions
    - What information should be provided to the ICU nurse for good continuity of care?
    - What kind of care is expected to occur in the ICU?
- Tabbed iPad Prompts & Content Changes

EXIT

Students may exit after **QR Code: Facilitator** scanned indicating patient is ready to be transported

DEBRIEF

SUGGESTED QUESTIONS

1. Reaction: “How do you feel this scenario went?” (Allow students to vent their emotional reactions before delving into learning objectives.)
2. Review understanding of learning objective: Integrate evidence-based practice while using the nursing process to care for a pediatric patient with asthma on a ventilator
    a. Describe evidence-based practices associated with caring for a patient on a ventilator.
    b. Describe how the RASS scale is used to evaluate sedation in patients on a ventilator
    c. Outline evidence-based interventions to prevent Ventilator Associated Pneumonia.
    d. When a ventilator alarms, what is the best response by the nurse?
3. Perform a focused respiratory assessment on a pediatric patient with asthma
    a. What were your concerns after your initial focused respiratory assessment for both the patient and the ventilator?
    b. What follow-up was required? Why?
4. Review understanding of learning objective: Participate in procedures used to screen, diagnose, and treat pediatric patients with asthma
    a. How were ABGs used to manage this patient experiencing an acute asthma exacerbation?
    b. How were Chest Xrays used to manage a patient who is intubated?
5. Review understanding of learning objective: Safely administer respiratory system medications
    a. What medications were used to treat Patrick’s status?
        i. What is the mechanism of action for these medication(s)?
        ii. Were these medications effective for Patrick?
6. Review understanding of learning objective: Effectively utilize therapeutic communication while caring for a pediatric patient experiencing an acute exacerbation of asthma
    a. How did you communicate therapeutically with Patrick’s father when he arrived and found his son on a ventilator?

   b. How did you communicate therapeutically during the "acute event?"
   c. How should family members in the room be managed during a "crisis situation?"
   d. If you could "do over," would you change your therapeutic approach?

7. Review understanding of learning objective: Demonstrate effective interprofessional communication and collaboration
   a. What is the role of the respiratory therapist when collaboratively caring for a patient on a ventilator?
   b. If you could "do over," would you change how you communicated and collaborated with other health care disciplines during the care of your patient today?
8. Summarize/Take Away Points:
   a. "In this scenario, you assessed a patient with asthma who was intubated and ventilated due to an acute asthma exacerbation in the ED. What is one thing you learned from participating in this scenario that you will take into your nursing practice?" (Ask each student to share something unique from what the other students share.)

NOTE: Debriefing technique is based on INASCL Standard for Debriefing and NLN Theory-Based Debriefing by Dreifuerst.

SURVEY

Print this page and provide to students.

Students, please complete a brief (2-3 minute) survey regarding your experience with this ARISE simulation. There are two options:

1. Use QR Code: Survey
    a. Note: You will need to download a QR Code reader/scanner onto your own device (smartphone or tablet). There are multiple free scanner apps available for both Android and Apple devices from the app store.
    b. This QR Code will not work in the ARIS app.

SURVEY

2. Copy and paste the following survey link into your browser.

https://ircvtc.co1.qualtrics.com/SE/?SID=SV_6Mwfv98ShBfRnBX

APPENDIX A: RASS SCALE

The Richmond Agitation–Sedation Scale		
Score	**Term**	**Description**
+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient–ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	Spontaneously pays attention to caregiver
-1	Drowsy	Not fully alert, but has sustained (more than 10 seconds) awakening, with eye contact, to voice
-2	Light sedation	Briefly (less than 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Instructions for Use

1. Observe patient. Is patient alert and calm (score 0)?
    - Does patient have behavior that is consistent with restlessness or agitation (score +1 to +4 using the criteria above, under description?)
2. If patient is not alert, in a loud speaking voice state patient's name and direct patient to open eyes and look at speaker. Repeat once if necessary. Can prompt patient to continue looking at speaker.
    - Patient has eye opening and eye contact, which is sustained for more than 10 seconds (score -1).
    - Patient has eye opening and eye contact, but this is not sustained for 10 seconds (score -2).
    - Patient has any movement in response to voice, excluding eye contact (score -3).
3. If patient does not respond to voice, physically stimulate patient by shaking shoulder and then rubbing sternum if there is no response to shaking shoulder.
    - Patient has any movement to physical stimulation (score -4).
    - Patient has no response to voice or physical stimulation (score -5).

Credit:

Sessler, C, Gosnell, M, Grap, M, Brophy, G et al. (2002). The Richmond Agitation–Sedation Scale. American Journal of Respiratory and Critical Care Medicine, Vol. 166, No. 10 (2002), pp. 1338-1344. doi: 10.1164/rccm.2107138

APPENDIX B: VENTILATOR ORDER SET (VAP BUNDLE)

Nursing and Respiratory Care

- Elevate head of bed at 30 degrees or greater
- Evaluate need for kinetic bed therapy
- Cuff pressure 20-25 cm H_2O
- Circuit changes: only when visibly soiled or mechanically malfunctioning
- Humidifiers or moisture exchangers: change only when visibly soiled or mechanically malfunctioning
- Oral care:
    - Assess oral cavity and lips every 6-8 hours and prn for hydration, lesions, thrush, pressure ulcers, infection
    - Oral care and brush teeth for 1-2 minutes every 6-8 hours with 2% chlorhexidine
    - Apply water-soluble lip balm every 6 -8 hours after oral care to maintain moisture
- Use a dedicated suction line for endotracheal suctioning of respiratory secretions
- Rotate position of oral endotracheal tube at least every 24 hours or use ETT holder that takes pressure off mouth
- Assess patient daily for sedation reduction and readiness to extubate per agency guidelines

Medications

- Famotodine 20 mg IV every 12 hours for stress ulcer prophylaxis
- Enoxaparin 40 mg subq every 24 hours for prophylaxis
    - Notify provider if bleeding occurs
    - Discontinue if platelet levels drop by 50% from baseline

Credit:

How-to Guide: Prevent Ventilator-Associated Pneumonia. Cambridge, MA: Institute for Healthcare Improvement; 2012. (Available at www.ihi.org).

APPENDIX C: PATIENT EDUCATION HANDOUT

MANAGING YOUR ASTHMA

If you suffer from asthma, an obstructive disease of that affects lungs, you're not alone. Over 26 million people in the U.S. are affected by asthma. With asthma, the airways in the lungs are narrowed, inflamed, or twitchy. The obstruction of the airways can make it difficult to breathe. Asthma symptoms can be well managed using the following guidelines:

LIFESTYLE MODIFICATIONS

Be aware of your asthma symptoms.

Learn about your symptoms of asthma. One of the most common symptom of asthma is wheezing. It is a musical, high-pitched, whistling sound made when airflow is blocked in the lungs. Sometimes, the only symptom of asthma is coughing. The cough is usually non-productive, chronic, and mostly at night. You may also notice shortness of breath, difficulty breathing or chest tightness.

Know your Asthma Action Plan.

Follow the advice provided by your health care provider. Every person with asthma is different, and your Asthma Action Plan will give you specifics for your particular asthma symptoms and lifestyle. This can take the guess-work out if you experience an asthma attack and can be shared with others if you need assistance.

Use your peak flow meter.

Track your asthma using a peak flow meter. The peak flow meter measures how fast you can push air out of the lungs. Decreases in peak flow meter results can signal an upcoming asthma attack, so it's important to monitor your results.

Know when to see your provider.

If you notice an increase in episodes, severity, or symptoms at night you should talk with your provider. Also, if you're limiting your normal activities, missing a lot of work or school, or feel like you're not reaching your personal best on a regular basis you should see your doctor. A visit is also a good idea if your asthma medications don't seem to work anymore, or you're using quick-relief inhalers more than twice per week. You should also see your doctor at least once a year for new prescriptions for your medication.

Seek emergency treatment when necessary.

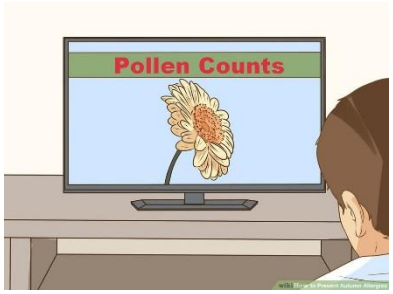
Asthma can become a serious, life-threatening condition very quickly, so you should seek immediate assistance if you have the following symptoms:

- Severe difficulty breathing
- Lips, fingers, or fingernails turning blue
- Feeling as though you are about to pass out
- Not being able to walk or talk in full sentences.

Recognize the medications used to treat your asthma.

The goal of asthma treatment is to control your symptoms and maintain your lung function over time. Albuterol is a "quick-relief" medicine to help open your airways. It is also used during a severe asthma attack. Advair is a long-term "control" medicines used to reduce inflammation of your lungs and to decrease the frequency and severity of asthma attacks. However, Advair is not useful during an acute asthma attack.

Avoid allergic triggers



Identify allergens that trigger your asthma. Allergens are substances that cause allergic reactions. Common outdoor allergens include pollens from grass, trees, and weeds. Common indoor allergens include dust mites, cockroaches, mold, and pets. While it may not always be possible to avoid allergens, you can talk to your doctor about allergy treatments or medications. You can also try to decrease the effects of allergens on asthma by:

- Avoiding yard work
- Tracking the pollen report
- Covering mattresses and pillows with hypoallergenic covers
- Using HEPA air filters
- Replacing carpet with wood or tile floors
- Removing garbage from the home daily
- Using bait stations or traps to control roaches (or calling an exterminator)
- Cleaning damp areas weekly to prevent mold growth
- Avoiding the use of vaporizers and humidifiers
- Avoiding pets with fur or feathers

Other triggers to avoid

Watch for medicine or illness triggers. Colds, flu, and sinus infections are some upper respiratory illnesses that can irritate your airways and cause asthma attacks. To fight these illnesses, frequently wash your hands and get a flu shot every year. Note: some aspirin and anti-inflammatory medicines like ibuprofen and naproxen are responsible for some asthma flare-ups. Check labels on over-the-counter and prescription medications to avoid these substances.

Avoid smoke

If you smoke, stop smoking. Smoking irritates the mucous linings of the airways which stimulates them to produce more mucus than normal. It also greatly increases your risk of other lung problems and cancer. If you have asthma, you should quit smoking to give your sensitive lungs a chance to recover. Avoid being around smoke in general. Second hand smoke can also wreak havoc on the linings of your airways so try to avoid being around cigarette smoke as much as possible.

Exercise

Strengthen your lungs through moderate exercise. While strenuous exercise when your lungs are weak could lead to an asthma attack, moderate exercise can actually strengthen your lungs. Start with light or moderate exercises, like walking, and work your way into a more challenging workout regimen. Exercise most days of the week for at least 30 minutes. Talk with your provider to tailor an exercise routine that fits the limitations of your asthma.

Content adapted from: http://www.wikihow.com/Control-Asthma

CREDITS

Asthma action plan from National Heart, Lung and Blood Institute at https://www.nhlbi.nih.gov/health/resources/lung/asthma-action-plan

Medication information from National Library of Medicine: Daily Med at http://dailymed.nlm.nih.gov/dailymed/

Normal lung sounds from Thinklabs Medical, LLC, Centennial, CO at http://www.thinklabs.com/lung-sounds

Patient education handout images adapted from wikiHow at http://www.wikihow.com

Richmond Agitation–Sedation Scale (2002) from Sessler, C, Gosnell, M, Grap, M, Brophy, G et al. (2002). The Richmond Agitation–Sedation Scale. American Journal of Respiratory and Critical Care Medicine, Vol. 166, No. 10 (2002), pp. 1338-1344. doi: 10.1164/rccm.2107138

Ventilator Associated Pneumonia. Cambridge, Massachusetts: Institute for Healthcare Improvement; [2017] at www.IHI.org

Wheeze lung sound from Wikipedia at https://en.wikipedia.org/wiki/Wheeze

REFERENCES

Fuchs, B., and Bellamy, C. (2016) Sedative-analgesic medications in critically ill adults: Selection, initiation, maintenance and withdrawal. In: UptoDate, (Ed), Finlay, G. UptoDate, Waltham, MA. (Accessed on January 1, 2018.)

Global Initiative for Asthma (2016). Pocket Guide for Asthma Management and Prevention. Downloaded from: http://ginasthma.org/2016-gina-report-global-strategy-for-asthma-management-and-prevention/

Hou, P, Baez, A. (2017). Mechanical Ventilation of adults in the emergency department. In: UptoDate, Walls, R. (Ed), UptoDate, Waltham, MA. (Accessed on January 1, 2018).

How-to Guide: Prevent Ventilator-Associated Pneumonia. Cambridge, MA: Institute for Healthcare Improvement; 2012. (Available at www.ihi.org)

Institute for Healthcare Improvement (2017). Ventilator Associated Pneumonia. Downloaded from: http://www.ihi.org/topics/VAP/Pages/default.aspx

Joint Commission (2016). Children's Asthma Care. Downloaded from https://www.jointcommission.org/childrens_asthma_care/.

Kerson, A. G., DeMaria, R., Mauer, E., Joyce, C., Gerber, L. M., Greenwald, B. M., & ... Traube, C. (2016). Validity of the Richmond Agitation-Sedation Scale (RASS) in critically ill children. Journal of Intensive Care, 465.

National Heart, Lung, Blood Institute (2007) The Expert Panel Report 3 (EPR–3) Guidelines for the Diagnosis and Management of Asthma. Downloaded from: http://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines)

Sawicki, G. and Haver, K. (2017). Acute asthma exacerbations in children: Home/office management and severity assessment. In: UptoDate, TePas, E. (Ed), UptoDate, Waltham, MA. (Accessed on January 1, 2018)

Scarfone, R. (2017). Acute asthma exacerbations in children: Emergency department management. In: UptoDate, TePas E (Ed), UptoDate, Waltham, MA (Accessed on January 1, 2018.)

Sessler, C, Gosnell, M, Grap, M, Brophy, G et al. (2002). The Richmond Agitation–Sedation Scale. American Journal of Respiratory and Critical Care Medicine, Vol. 166, No. 10 (2002), pp. 1338-1344. doi: 10.1164/rccm.2107138

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The U.S. Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership. This is an equal opportunity program. Assistive technologies are available upon request and include Voice/TTY (771 or 800-947-6644).