

PEDIATRIC ASTHMA

Estimated Time: 40 minutes • Debriefing Time: 30 minutes



Scan to Begin



Patient Name: Patrick A. Armstrong

SCENARIO OVERVIEW

Patrick A. Armstrong is a 16-year-old male patient who was brought to the emergency department today by his friend's dad with a severe exacerbation of his known asthma. His asthma is normally well-controlled, but there was an unintended exposure to a cat while he was at his friend's house. Students are called to the patient room emergently at the beginning of this scenario. Students should complete an RT consult and administer a Duoneb treatment while the RN starts an IV and administers steroids. He doesn't improve so students should recommend a continuous nebulizer to the provider. This scenario revolves around the management of a patient during an acute exacerbation of asthma, the initiation and management of a continuous albuterol nebulizer, and communication with the interprofessional team.

LEARNING OBJECTIVES

1. Obtain vital signs and interpret for a pediatric patient
2. Perform a focused respiratory assessment
3. Recognize and respond to abnormal findings
4. Evaluate objective and subjective data and recommend treatment options to provider
5. Implement and follow evidence-based standards and protocols
6. Safely administer inhaled medications
7. Demonstrate appropriate communication
8. Document accurately

CURRICULUM MAPPING

WTCS RESPIRATORY THERAPY PROGRAM OUTCOMES

- Apply respiratory therapy concepts to patient care situations
- Demonstrate technical proficiency required to fulfill the role of a respiratory therapist
- Practice respiratory therapy according to established professional and ethical standards

RESPIRATORY AND CIRCULATORY PHYSIOLOGY

- Apply principles of ventilatory mechanics

RESPIRATORY DISEASE

- Interpret results of simple spirometry
- Analyze signs, symptoms, etiology, pathogenesis and treatment for obstructive lung disorders

RESPIRATORY PHARMACOLOGY

- Compare and contrast drug forms, routes of administration and vehicles
- Examine the pharmacodynamics of bronchodilators

RESPIRATORY SURVEY

- Perform pulse oximetry
- Adapt communication strategies to a diverse patient population
- Review the medical record utilizing medical record keeping and charting methods consistent with hospital policy and procedures
- Utilize infection control principles
- Obtain a focused health history
- Evaluate patient data
- Perform a respiratory assessment
- Obtain vital signs

RESPIRATORY THERAPEUTICS 1

- Develop a care plan
- Evaluate oxygenation
- Assess the need for medical gas therapy
- Demonstrate medication delivery devices

RESPIRATORY NEONATAL/PEDIATRICS

- Differentiate cardiopulmonary diseases/disorders of the neonatal/pediatric patient
- Develop a therapeutic care plan for the neonatal/pediatric patient

RESPIRATORY CLINICAL COMPETENCIES

- Apply standard precautions
- Assess vital signs
- Perform pulse oximetry
- Perform chart review
- Perform a pulmonary exam
- Administer aerosolized medication therapy

- Set up a large volume nebulizer

SIMULATION LEARNING ENVIRONMENT & SET-UP

ENVIRONMENT

Inside room: Patient in bed, as close to fowlers position as possible

Inside or outside room: Hand sanitizer and/or sink

Outside room: Computer or form(s) for documentation

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)

Code Status: Full Code

Admitting Diagnosis: shortness of breath (R06.02)

Medical History: asthma, unspecified (493.90)

Allergies: NKDA

Surgical History: None

Ethnicity: African American

Spiritual Practice: Unknown

Primary Language: English

EQUIPMENT/SUPPLIES/SETTINGS

Patient

- In patient gown
- No moulage
- ID band present with QR code

Monitor Settings





- No monitor
- Simulator vitals: HR 110, RR 30, BP 132/98, Temp 38.4, O2 Sat 95% on non-breather mask, Pain 4/10

Supplies

- General

- Respiratory Equipment
 - Device to measure Peak Flow (and FEV1)
 - Various oxygen devices
 - Nebulizer
 - Equipment for a continuous nebulizer – scenario protocol has instructions for both the HEART® and HOPE™ systems
- Optional:
 - Cell phone
- Medications (realistic labels are available by scanning the QR code)
 - Duoneb vial
 - Multiuse bottle of Albuterol
 - Bottle Normal Saline

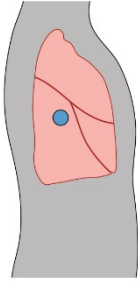
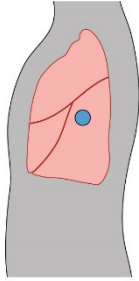


QR CODES

START 	PATIENT 	REPORT 	PATIENT ID 
IV SITE 	DUONEB 	CONTINUOUS ALBUTEROL 	SBAR 
HOPE NEBULIZER 	HEART NEBULIZER 		

CHEST QR CODES

Cut along the dotted lines. Fold along the solid line to create a bi-fold of the diagram and QR code.

			
ANTERIOR 2	ANTERIOR 3	ANTERIOR 6	ANTERIOR 7
			
			
POSTERIOR 0	POSTERIOR 1	POSTERIOR 4	POSTERIOR 5
			

	
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.
 - For some scenarios, it may be helpful to tell students where the QR code are located. For others, you may want students to “find” the QR codes during their assessments. This is your choice.
 - Describe how a QR code sound will work in the scenario. For the most authentic sound experience, student should use ear buds or the ARISE “stethoscope” for all QR codes with the following symbol: 📻. Example: **QR Code: Chest Anterior 1 📻**
 - 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.
 - Level Up tab – This tab “tells” the content in the iPad to change to what is needed for the next state of a simulation. It is used a few times in this scenario after the provider is notified to display new orders (those just given over the phone) and lab results, etc...
 - Medication QR Codes – The student(s) must scan **QR Code: Patient ID** prior to scanning any medication. That scan is valid for 2 minutes and then it “times out.” The student(s) will need to scan **QR Code: Patient ID** again to give more medications.
 - MAR Hyperlinks – On the MAR 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 are your priorities for this patient?
 - How will you modify your approach for a pediatric patient?
- View “Patient” video on iPad
 - Possible Facilitator Questions
 - What communication strategies could you employ when you assess and evaluate Patrick?
- The iPad will stop on a white screen. Student should proceed directly to the patient room.
 - Facilitator Note
 - Students cannot view the tabbed content on the iPad prior to entering the patient’s room as this is an emergency.
 - Five minutes after the iPad lands on the white screen, the iPad will alert students with a “knocking sound” and display an image of the friend’s dad followed by a video of the dad explaining what happened.
 - During this five minutes, the iPad scanner will **ONLY** work for **QR Codes: Patient ID, IV Site** and all **Chest** sounds. The Duoneb will not work until after the video of the friend’s dad is viewed.
 - When the video ends and students press “continue” the iPad is on the Patient Profile screen and the patient’s chart is available for review.

STATE 1

RT CONSULT & DUONEB ADMINISTRATION

- Patient Overview
 - The patient is in bed in a fowler’s position. He is on a non-rebreather mask and quite tachypneic. It is clear he is in some distress. Students should assess the patient and administer a Duoneb treatment ASAP.
 - Facilitator Note
 - Five minutes into the scenario, the iPad will alert students with a sound that his friend’s dad wants to speak with them. An image of the dad is displayed on the iPad followed by a video of the dad explaining what happened.
 - When the video ends and students press “continue” the iPad is on the Patient Profile screen and the patient’s chart is now available. See the tabbed iPad content below.
 - During the first five minutes, the iPad scanner will **ONLY** work for **QR Codes: Patient ID, IV Site** and all **Chest** sounds. The Duoneb will not work until after the video of the friend’s dad is viewed.
- Expected Student Behaviors
 - Perform appropriate hand hygiene and infection control
 - Introduce themselves and verify the patient (can scan **QR Code: Patient ID**)
 - Obtain vital signs and interpret for a pediatric patient
 - This patient would have vitals similar to an adult of his size.
 - Perform a focused respiratory assessment
 - Inspection – Students will not find any abnormalities. (May scan **QR Code: IV** to see that an IV was started.)
 - Palpation – Students will not find any abnormalities.
 - Percussion – All areas have hyperresonant tones.
 - Auscultation – Scan **QR Code: Chest** 🗣️

- There are ten QR codes to apply to the chest – see above Chest QR Code chart for locations
- Student will hear diffuse wheezing in all lung fields
- Students may ask questions as part of this assessment, but it should not delay the administration of the Duoneb.
 - Questioning may continue into state 2 of the scenario.
 - He is unable and refuses to perform a Peak Flow or FEV1 if students ask.
 - Questions can include:
 - How long have you had asthma?
 - Answer: “All my life – *gasp* – I guess.”
 - Have you ever been admitted to the hospital for your asthma?
 - Answer: “I don’t – *gasp* – remember, but – *gasp* – my mom said I – *gasp* – had pneumonia when – *gasp* – I was a baby.”
 - What are your triggers?
 - Answer: “What are triggers?” (He is confused and doesn’t know what this means.)
 - When the student(s) explains “triggers,” he says, “Cats – *gasp* – spring allergies – *gasp* – and sometimes when – *gasp* – I get a cold.”
 - What medications do you take for your breathing?
 - Answer: “Just my inhaler.”
 - How often do you take them?
 - Answer: “Not that often – *gasp* – I haven’t had – *gasp* – to take it – *gasp* – in a few months.”
 - Do you take any other medications?
 - Answer: “Ibuprofen sometimes.”

- Do you smoke?
 - Answer: “No!!! Coach and – *gasp* – and my mom – *gasp* – would kill me! And so would me mom!”
- Does anyone in your household smoke?
 - Answer: “Nope.”
- Do you own/use a peak flow meter?
 - Answer: “I have before – *gasp* – but not for – *gasp* – a long – *gasp* – time.”
- Do you have an asthma action plan?
 - Answer: “What’s that?”
- Recognize and respond to abnormal findings
- Safely administer nebulized medication (Scan **QR Code: Duoneb**)
 - Student(s) must scan **QR Code: Patient ID** prior to medication administration. If not scanned, the iPad will read, “ERROR: No patient information identified.”
 - Since the patient is on a non-rebreather mask, students should recognize the need to place the patient on a nasal cannula or high-flow nasal cannula during the administration of the Duoneb.
 - Breath sounds, vitals, etc., do not change after the administration of the Duoneb.
- Technician Prompts
 - Patient complains of shortness of breath and speaks in 2-3 word sentences. He is unable and refuses to perform a Peak Flow or FEV1 if students ask.
 - Patient responses can include:
 - “I can’t breathe!”
 - “Why didn’t my – *gasp* – puffer work?”
 - “Are you – *gasp* – going to help – *gasp* – me?”
 - When asked patient history questions, the patient has a difficult time answering them because of his current condition. His responses should be

short and in 2-3 word responses. Throughout any questioning, he should keep repeating phrases such as:

- “I can’t breathe.”
- “Please help me.”
- “I think – *gasp* – I need – *gasp* – a nebulizer.”
- Questions (these may continue into state 2) can include:
 - How long have you had asthma?
 - Answer: “All my life – *gasp* – I guess.”
 - Have you ever been admitted to the hospital for your asthma?
 - Answer: “I don’t – *gasp* – remember, but – *gasp* – my mom said I – *gasp* – had pneumonia when – *gasp* – I was a baby.”
 - What are your triggers?
 - Answer: “What are triggers?” (He is confused and doesn’t know what this means.)
 - When the student(s) explains “triggers,” he says, “Cats – *gasp* – spring allergies – *gasp* – and sometimes when – *gasp* – I get a cold.”
 - What medications do you take for your breathing?
 - Answer: “Just my inhaler.”
 - How often do you take them?
 - Answer: “Not that often – *gasp* – I haven’t had – *gasp* – to take it – *gasp* – in a few months.”
 - Do you take any other medications?
 - Answer: “Ibuprofen sometimes.”
 - Do you smoke?
 - Answer: “No!!! Coach and – *gasp* – and my mom – *gasp* – would kill me! And so would me mom!”
 - Does anyone in your household smoke?

- Answer: “Nope.”
- Do you own/use a peak flow meter?
 - Answer: “I have before – *gasp* – but not for – *gasp* – a long – *gasp* – time.”
- Do you have an asthma action plan?
 - Answer: “What’s that?”
- Possible Facilitator Questions
 - Analyze the vital signs: are they within normal limits for his age?
 - Analyze the findings from your physical assessment: do you have any concerns?
 - Based on your findings, what is the best course of treatment to recommend to the provider?
- Tabbed iPad Prompts & Content

H&P

No reports available.

ORDERS

Patient Name	DOB	MR#
<i>Patrick A. Armstrong</i>	<i>11/16/20XX</i>	<i>1116</i>
Allergies	Height (cm)	Admission Weight (kg)
<i>NKDA</i>	<i>177.5</i>	<i>109</i>

Provider Orders

Date	Time	Order
Today	Now	STAT RT Consult – exacerbation of asthma
		STAT Duoneb with peak flow pre- and post- treatment if patient is able
		RT to update provider after Consult and Duoneb
		O2 to keep SpO2 > 90%

		STAT portable chest x-ray – shortness of breath/asthma
		STAT CBC with Differential
		Methylprednisolone IV – 1 mg/kg STAT
		Tylenol PO – 325 mg every 4-6 hours prn for pain and/or fever
		Place on telemetry and record vitals and LOC at least every 20
		minutes
		Electronically signed, James Emerson, M.D.

MAR

Patient Name	DOB	MR#
<i>Patrick A. Armstrong</i>	<i>11/16/20XX</i>	<i>1116</i>
Allergies	Height (cm)	Admission Weight (kg)
<i>NKDA</i>	<i>177.5</i>	<i>109</i>

Medication Administration Record

Scheduled		
Duoneb (unit dose vial), STAT	Due Today	Last Given
Methylprednisolone IV – 1 mg/kg, STAT	Due Today	Last Given
PRN		
Tylenol PO – 325 mg, Every 4-6 hours prn for pain and/or fever		Last Given

DAILY RECORD

Patient Name	DOB	MR#
<i>Patrick A. Armstrong</i>	<i>11/16/20XX</i>	<i>1116</i>
Allergies	Height (cm)	Admission Weight (kg)
<i>NKDA</i>	<i>177.5</i>	<i>109</i>

Daily Record

Vitals	Today – 5 minutes ago				
Pulse	116				
Resp. Rate	34				
BP Systolic	138				
BP Diastolic	98				
Temp (°C)	38.4				
O2 Saturation (%)	85%				
Applied Oxygen	RA				
Pain	4				

VITALS

The iPad shows the “enterable” vitals screen.

PROGRESS NOTES

No reports available.

LABS-DIAGNOSTICS

No reports available.

IMAGING

No reports available.

LEVEL 1 / 2

- When the Level 1 tab is tapped, the iPad reads, “The iPad is at Level 1.”
- After the student(s) scans **QR Code: Duoneb**, the Level 1 tab will automatically change to a Level 2 tab (students are not prompted about this).

- When the Level 2 tab is tapped, the iPad reads, “The iPad is at Level 2.”

SCANNER

Use this to scan available QR Codes.

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 2

TREATMENT RECOMMENDATION

- Patient Overview
 - The patient doesn't improve following the Duoneb treatment. However, he doesn't deteriorate either. Students must recommend a course of treatment to the provider. According to evidence-based standards, a continuous nebulizer is the best option at this time. Students should also recognize the need to monitor serum K and glucose as well as continuous ECG.
- Expected Student Behaviors
 - Evaluate subjective and objective data
 - Both Imaging and Labs have resulted at the beginning of this state (students are not prompted to this).
 - Recommend continuous nebulizer to provider
 - Recommendation to include: continuous ECG and pulse oximetry monitoring as well as serum K and glucose monitoring.
 - Albuterol causes hypokalemia
 - Stress, albuterol and steroids cause increased hyperglycemia
 - Demonstrate appropriate communication
 - Students should use the SBAR format (scan **QR Code: SBAR**)
- Technician Prompts
 - Nothing is needed from the patient in this state as students should be talking with the provider.
 - The provider can be played by the technician, facilitator or another student. This can be done either on the phone or face-to-face.
 - The students should use SBAR format.
 - The person playing the provider role should ensure all subjective and objective data is provided and accurate.
 - If students have not included the imaging and lab results in the SBAR, the provider should ask for them.

- Give the following orders to the students and tell them you are entering them in the EMR:
 - Continuous albuterol nebulizer @ 15 mg/hr for 2 hours then reevaluate peak flow and FEV1
 - STAT serum electrolytes and glucose level
 - Continuous cardiac and pulse oximetry monitoring
 - Strict NPO in case intubation required
- Possible Facilitator Questions
 - How is the SBAR communication model important to healthcare communication?
 - What other therapies could be considered if Patrick's condition worsens and/or the continuous nebulizer doesn't help?
 - Discussion can include: Heliox, BiPAP, intubation, magnesium, etc.
- Tabbed iPad Prompts & Content

MAR

Patient Name	DOB	MR#
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Allergies	Height (cm)	Admission Weight (kg)
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Medication Administration Record

Scheduled		
	Due Today	Last Given
PRN		
Tylenol PO – 325 mg, Every 4-6 hours prn for pain and/or fever		Last Given
		Today @ 0500
Discontinued		

Duoneb (unit dose vial), STAT	Discontinued	Last Given
	Today – 10 minutes ago	Today – 10 minutes ago
Methylprednisolone IV – 1 mg/kg, STAT	Discontinued	Last Given
	Today – 10 minutes ago	Today – 10 minutes ago

LABS-DIAGNOSTICS

Patient Name	DOB	MR#
<i>Patrick A. Armstrong</i>	<i>11/16/20XX</i>	<i>1116</i>
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Laboratory Results

CBC with Differential					
	Today @ 0300	Today @ 0500	[time]	Units	Reference Range
WBC	11.8			x10 ³ uL	F: 4.7-10.3/M: 4.5-10.5
RBC	4.8			x10 ⁶ uL	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			x10 ⁹ uL	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

IMAGING

Patient Name	DOB	MR#
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Imaging Report

DESCRIPTION: Portable x-ray to evaluate acute shortness of breath/asthma.

EXAM: Portable AP chest

REASON FOR EXAM: Shortness of breath/asthma

COMPARISON EXAM: None

TECHNIQUE: 1.5 mAS @ 125 kvp

DISCUSSION: The heart and vasculature are normal. Trachea is midline. All visualized bony structures are unremarkable. Costophrenic angles are clear with some flattening of the diaphragm noted. Lung tissue is remarkable for hyperinflation. No infiltrates or atelectasis.

IMPRESSION: Flattened diaphragm and hyperinflation consistent with obstructive lung disorder. Clinical correlation suggested.

LEVEL 2/3

- When the Level 2 tab is tapped, the iPad displays a plaque that reads, “Have you called the Provider?”
 - If “No,” the iPad reads, “You must call the provider before advancing to Level 3.”
 - If “Yes,” the iPad reads, “The iPad is at Level 3.”

STATE 3

CONTINUOUS NEBULIZER

- Patient Overview
 - The students should assemble and implement a continuous nebulizer per the policy included under the Protocol tab in the iPad. This policy includes directions for both the Hope and Heart nebulizers.
- Expected Student Behaviors
 - Implement continuous nebulizer
 - A Continuous Nebulizer policy is provided in the iPad under the Protocol tab.
 - This tab automatically appears when the iPad changes from Level 2 to Level 3.
 - See Appendix A for a printable version.
 - Safely administer inhaled medications (Scan **QR Code: Continuous Albuterol**)
 - Ensure patient is placed on a continuous ECG and pulse oximetry monitoring.
 - May scan **QR Code: Hope Nebulizer** or **QR Code: Heart Nebulizer** for images of those continuous nebulizers already set up.
 - Demonstrate appropriate communication
 - Document accurately
- Technician Prompts
 - The patient continues to be in moderate distress and only able to speak in 2-3 word sentences. He is anxious and scared and is asking for his parents who have not arrived yet.
 - Patient responses can include:
 - “I still can’t – *gasp* – breathe very well.”
 - “I’m a little – *gasp* – scared.”
 - “When are my – *gasp* – mom and dad – *gasp* – going to get here?”

- “How long – *gasp* – till I can – *gasp* – play football again.”
- When talking about the continuous nebulizer:
 - “What is – *gasp* – this thing for?”
 - “How long – *gasp* – do I have – *gasp* – to wear it?”
- Possible Facilitator Questions
 - How will you address Patrick’s concerns regarding his anxiety, being scared and that his parents are not present?
- Tabbed iPad Prompts & Content

ORDERS

Patient Name	DOB	MR#
Patrick A. Armstrong	11/16/20XX	1116
Allergies	Height (cm)	Admission Weight (kg)
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Provider Orders

Date	Time	Order
Today	20 minutes ago	STAT RT Consult – exacerbation of asthma
		STAT Duoneb with peak flow pre- and post- treatment if patient is able
		RT to update provider after Consult and Duoneb
		O2 to keep SpO2 > 90%
		STAT portable chest x-ray – shortness of breath/asthma
		STAT CBC with Differential
		Methylprednisolone IV – 1 mg/kg STAT
		Tylenol PO – 325 mg every 4-6 hours prn for pain and/or fever
		Place on telemetry and record vitals and LOC at least every 20 minutes
		Electronically signed, James Emerson, M.D.
Today	Now	Continuous albuterol nebulizer – 15 mg/hr for 2 hours then reevaluate peak flow and FEV1

		STAT serum electrolytes and glucose level
		Continuous cardiac and pulse oximetry monitoring
		Strict NPO in case intubation required
		Electronically signed, James Emerson, M.D.

MAR

Patient Name	DOB	MR#
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Allergies	Height (cm)	Admission Weight (kg)
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Medication Administration Record

Scheduled		
Albuterol nebulizer – 15 mg/hr for 2 hours	Due Today	Last Given
PRN		
Tylenol PO – 325 mg, Every 4-6 hours prn for pain and/or fever	Last Given	
	Today @ 0500	
Discontinued		
Duoneb (unit dose vial), STAT	Discontinued	Last Given
	Today – 10 minutes ago	Today – 10 minutes ago
Methylprednisolone IV – 1 mg/kg, STAT	Discontinued	Last Given
	Today – 10 minutes ago	Today – 10 minutes ago

PROTOCOL

See Appendix A

LEVEL 3/EXIT

- When the Level 3 tab is tapped, the iPad reads, “The iPad is at Level 3.”
- Five minutes after **QR Code: Continuous Albuterol** is scanned; the Level 3 tab will automatically disappear (students are not prompted about this).
- When the Exit tab is tapped, the iPad reads, “Scenario objectives have been met. Are you sure you want to exit the game?”
 - 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.

DEBRIEF

Nothing needed from the iPad.

QUESTIONS

1. How did you feel this scenario went?
2. What were the main issues you had to deal with when caring for Patrick?
3. Review understanding of learning objective: Obtain vital signs and interpret for a pediatric patient.
 - a. What vital signs are within normal range for a 16-year-old male?
 - b. Interpret Patrick's vital signs: Were they in range? What could be affecting Patrick's vital signs?
4. Review understanding of learning objective: Perform a focused respiratory assessment.
 - a. What concerns did you find during your initial assessment and evaluation?
 - b. How would your assessment of Patrick compare to what you would expect of an asthmatic patient?
 - c. Did you alter your assessment for this pediatric patient? Why or why not?
 - d. What pieces of data were significant in Patrick's health history?
 - e. If you could "do over" any part of getting Patrick's history, what would it be and why?
5. Review understanding of learning objective: Recognize and respond to abnormal findings.
 - a. What abnormal findings did you find in the vital signs and/or physical assessment? How did you respond to these findings?
6. Review understanding of learning objective: Evaluate objective and subjective data and recommend treatment options to provider.
 - a. Describe the conclusions you made given the available subjective and objective data.
 - b. Are there any other pieces of data you wish you had?
 - c. Describe the treatment recommendations you will give to the provider.

7. Review understanding of learning objective: Implement and follow to evidence-based standards and protocols.
 - a. Why is it important to follow evidence-based standards?
 - b. How do protocols affect a respiratory therapist?
8. Review understanding of learning objective: Safely administer inhaled medications.
 - a. Did you have any concerns about administering the medications that were ordered? Why or why not?
 - b. Would you change anything about how you administered the medication?
9. Review understanding of learning objective: Demonstrate appropriate communication
 - a. Were the communication techniques you used with Patrick effective? Why or Why not?
 - b. How is SBAR communication critical to ensuring effective communication?
 - c. If Patrick's parents had been with him, how would you have communicated with them in comparison to how you communicated with Patrick?
 - d. If you could "do over," how would you change your communication with Patrick or the provider?
10. Review understanding of learning objective: Document accurately.
 - a. What is important to document in your assessments and interventions?
11. Summary/Take Away Points
 - a. "Today you cared for a pediatric patient who was experiencing a severe exacerbation of his known asthma. What is one thing you learned from participating in this scenario that you will take with you into your nursing practice?" (Each student must share something different from what the others' 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.



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

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

APPENDIX A

CONTINUOUS NEBULIZATION

1. Policy Statements

- a. The Respiratory Therapy Department shall provide continuous nebulization of a bronchodilator to patients meeting specified indications.
- b. Indications for continuous nebulizer treatment includes severe asthma, severe reactive airway disease and/or impending respiratory failure that is non responsive to current evidence-based therapy.
- c. Patients must be monitored continuously with a cardiac monitor and pulse oximetry either in an intensive care setting or in the Emergency Department.
- d. Albuterol and Levalbuterol are the drugs available through the Pharmacy Department for this mode of therapy.

2. Policy

- a. The physician's order must include the following:
 - i. Type of therapy (continuous nebulization)
 - ii. Medication
 - iii. Dose/hr in mg (concentration of medication)
 - iv. Duration of treatment
- b. The Respiratory Care Practitioner will utilize either the HEART or HOPE nebulizer for the procedure.
- c. The aerosol should be delivered via an aerosol mask and large bore tubing. Oxygen therapy will be adjusted to maintain SpO₂ of greater than 92% through the use of a blending system or, when the nebulizer is powered by compressed air, a nasal cannula can be worn for low flow oxygen therapy. If mechanical ventilation is needed, see the “Continuous Nebulization with Mechanical Ventilation” policy.
- d. A blender will be used for patients needing precise FIO₂ control. The nebulizer flow must be kept at a constant rate and therefore cannot be used to adjust inspired oxygen concentration.
- e. A head hood may be used with infants. An adjustment in dose/diluent mixture to accommodate a 15 L/min flow may be needed.

3. Drug and Dosage Guidelines

- a. The acceptable dosage range for albuterol is 5mg/hr to 15mg/hr
- b. While optimal dosing for continuous nebulization has not been determined, a dose of 15 mg/hr is recommended for patients weighing >20 kg.

4. Medication Calculations

- a. HEART Nebulizer
 - i. Follow the specific package guidelines for proper medication administration.
 - ii. Below are example guidelines for several HEART products.

HEART

Flow (Output)	10 lpm (30 ml/hr)			15 lpm (50 ml/hr)		
Dose	5 mg/hr	10 mg/hr	15 mg/hr	5 mg/hr	10 mg/hr	15 mg/hr
Medicine (5 mg/ml)	1 ml	2 ml	3 ml	1 ml	2 ml	3 ml
Saline	29 ml	28 ml	27 ml	49 ml	48 ml	47 ml

MiniHEART-HiFlo

Flow (Output)	8 lpm (20 ml/hr)		
Dose	5 mg/hr	10 mg/hr	15 mg/hr
Medicine (5 mg/ml)	1 ml	2 ml	3 ml
Saline	19 ml	18 ml	17 ml

MiniHEART-LoFlo

Flow (Output)	2 lpm (8 ml/hr)					
Dose	2.5 mg/hr	5 mg/hr	7.5 mg/hr	10 mg/hr	12.5 mg/hr	15 mg/hr
Medicine (5 mg/ml)	0.5 ml	1 ml	1.5 ml	2 ml	2.5 ml	3 ml
Saline	7.5 ml	7 ml	6.5 ml	6 ml	5.5 ml	5 ml

UniHEART

Flow (Output)	2 lpm (4 ml/hr)			4 lpm (9 ml/hr)		
Dose	5 mg/hr	10 mg/hr	15 mg/hr	5 mg/hr	10 mg/hr	15 mg/hr
Medicine (5 mg/ml)	1 ml	2 ml	3 ml	1 ml	2 ml	3 ml
Saline	3 ml	2 ml	1 ml	8 ml	7 ml	6 ml

b. HOPE Nebulizer

- i. Follow the specific package guidelines for proper medication administration.
- ii. Below are example guidelines for the HOPE nebulizer.

Flow	10 lpm				
Time	1 hour	2 hours	3 hours	4 hours	5 hours
Saline (after medication is added, fill reservoir to equal)	25 ml	50 ml	75 ml	100 ml	125 ml
Dose	5 mg/hr				
Medicine (5 mg/ml)	1 ml	2 ml	3 ml	4 ml	5 ml
Dose	7.5 mg/hr				
Medicine (5 mg/ml)	1.5 ml	3 ml	4.5 ml	6 ml	7.5 ml
Dose	10 mg/hr				
Medicine (5 mg/ml)	2 ml	4 ml	6 ml	8 ml	10 ml
Dose	12.5 mg/hr				
Medicine (5 mg/ml)	2.5 ml	5 ml	7.5 ml	10 ml	12.5 ml
Dose	15 mg/hr				
Medicine (5 mg/ml)	3 ml	6 ml	9 ml	12 ml	15 ml

5. Assessment and Documentation

- a. The patient should remain on continuous nebulization until they have improved. This should be measured by peak flow, FEV1 and patient assessment.
- b. Criteria for discontinuance prior to patient improvement include increased side effects such as increased heart rate, palpitations, arrhythmias, nausea/vomiting or significant tremors. In addition, continuous nebulization should not preclude intubation if that is deemed necessary. See the “Continuous Nebulization during Mechanical Ventilation” policy.
- c. Following continuous nebulization, a trial of Q2 hour intermittent therapy should be attempted.
- d. The following will be documented by a Respiratory Care Practitioner every 30 minutes for the first two hours and every two hours thereafter:
 - i. Medication concentration
 - ii. Nebulizer output and flowrate
 - iii. FiO₂ or supplemental O₂
 - iv. Heart rate & rhythm, Respiratory rate, Blood Pressure and O₂ Saturation
 - v. Breath sounds
 - vi. Peak flow & FEV1 as tolerated
 - vii. Side effects (if applicable)
 - viii. Arterial blood gas information (if applicable)
 - ix. Level of consciousness

6. Precautions

- a. Follow cautions as specified in the “Medicated Aerosol” policy with additional consideration for the following:
- b. The presence of nausea (if a new finding), tremors and tachycardia indicate the need to discontinue therapy or reduce the medication dosage.
- c. Beta agonists can lower serum potassium and raise blood glucose. Monitoring and treatment of any abnormalities is warranted.
- d. If the mask is displaced, medication will not be delivered. Thus, patient cooperation and toleration is criteria for the provision of continuous therapy.

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<http://dailymed.nlm.nih.gov/dailymed/>

Pictures from Shutterstock.com

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