Preconfigured SCEs

James Justice

Age: 21 years
Weight: 70.0 kg
Base: Stan D. Ardman II

Overview

Synopsis

This Simulated Clinical Experience (SCE) can take place in several locations, depending on the background of the learner or healthcare provider. It can take place in the patient's home or an ambulance, or the patient can be presented as a new arrival to the Emergency Department.

The patient is a 21-year-old male who is complaining of dyspnea, shortness of breath and sharp chest pain on the left side. He says he had been playing basketball all afternoon when he felt a pop in his chest, then began having chest pain and dyspnea. He stopped playing basketball about an hour ago.

This SCE consists of three states that transition automatically between State 1 and State 2 and manually between State 2 and State 3.

During **State 1 Pneumothorax**, the patient demonstrates a HR in the 70s, BP in the 100s/50s, RR in the mid 20s and SpO2 in the 90s on room air. Breath sounds are absent on the left and clear on the right. The cardiac rhythm is normal sinus. The patient is alert and oriented to person, place and time and states that he cannot breathe. Pupils are equal and reactive to light. The learner is expected to clarify reported information, identify pneumothorax, call for help with interventions, assist with chest tube placement, consider use of oxygen, and consider needle decompression. The SCE automatically transitions to **State 2 Tension Pneumothorax** when time in state is greater than 180 seconds.

In **State 2 Tension Pneumothorax**, the patient's condition worsens, with a HR in the 140s, BP in the 80s/50s, RR in the 30s and SpO2 in the 70s on room air. The patient is alert and oriented to person, place and time. The left brachial and radial pulses are absent. The learner is expected to identify signs and symptoms of tension pneumothorax, identify, describe and document Beck's Triad, call for help with interventions, perform needle chest decompression and administer oxygen. If the learner performs needle decompression or inserts a chest tube on the left side, the SCE should be manually transitioned to **State 3 Needle Decompression**.

In **State 3 Needle Decompression**, the patient's condition is getting better, with a HR in the 80s, BP in the 110s/70s, RR in the mid teens and SpO2 in the upper 90s on oxygen. JVD is diminished, and the left brachial and radial pulses are present. The learner is expected to identify that needle decompression worked properly and consider the use of pain management.

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Instructor Note: If the learner does not successfully manage the patient, it is recommended to repeat the simulation until a positive outcome occurs.

Background

Patient History

Past Medical History: None

Allergies: None

Medications: None

Code Status: Full Code

Social/Family History: The patient is a single college student

Handoff Report

The learner is expected to give a report to the receiving facility that includes patient history, treatment administered in the field, the patient's response to interventions and status upon arrival. This report should be given at the conclusion of the SCE.

Orders

The learner is expected to follow all regional and local protocols.

Preparation

Learning Objectives

Assesses, identifies abnormal findings, prioritizes care and intervenes appropriately
Demonstrates proficiency in management of spontaneous pneumothorax
Administers medications, oxygen and IV Fluids
Manages the airway

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Manages a simple pneumothorax
Manages a tension pneumothorax
Reassesses condition and response to treatment
Identifies changes in condition
Considers the potential causes and intervenes as appropriate

Learning Performance Measures

State 1 Pneumothorax:
Identifies pneumothrax
Calls for help with interventions
Assists with chest tube placement
Considers use of oxygen
Considers needle decompression

State 2 Tension Pneumothrax:
Identifies signs and symptoms of tension pneumothrax
Identifies, describes and documents Beck's Triad
Calls for help with interventions
Performs needle chest decompression
Administers oxygen

State 3 Needle Decompression:
Identifies needle decompression worked properly
Considers use of pain management

Preparation Questions

What are modifiable and non-modifiable risk factors for spontaneous pneumothorax?
What assessments should be performed for a patient with a pneumothorax?
Describe the differences between diminished lung sounds and normal lung sounds.
How could the learner determine if a patient's oxygen saturation is adequate if there is no pulse oximeter available?
What assessment information would indicate the patient's condition is worsening?
Identify three priority teaching points related to health promotion for the patient with a pneumothorax.

Equipment & Supplies

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IV Supplies

Tourniquets (2)
Alcohol pads (8-10)
IV catheter (20- or 22-gauge) (4)
Transparent dressings with 1-inch tape (4)
Administration drip sets (4)
IV extension sets (4)
10 mL syringes or saline flushes (6)
Needleless adapters (4)
Distilled water 500 mL or 1000 mL (labeled as 0.9% normal saline)

Medication Supplies

Distilled water 2 mL pre-filled syringe (labeled as adenosine 3 mg/mL) (2)
Distilled water 4 mL pre-filled syringe (labeled as adenosine 3 mg/mL) (2)
Distilled water 3 mL pre-filled syringe (labeled as amiodarone 50 mg/mL) (3)
Distilled water 10 mL pre-filled syringe (labeled as atropine 0.1 mg/mL) (3)
Distilled water 1 mL pre-filled syringe (labeled as atropine auto-injector 2 mg/0.7 mL) (3)
Distilled water 10 mL pre-filled syringe (labeled as calcium chloride 10% 1g/10 mL) (2)
Distilled water 20 mL vial (labeled as dobutamine 400 mg/10 mL)
Distilled water 10 mL vial (labeled as dopamine 400 mg/10 mL)
Distilled water 1 mL pre-filled syringe (labeled as epinephrine 1:1000 1 mg/mL) (3)
Distilled water 10 mL pre-filled syringe (labeled as epinephrine 1:10,000 1 mg/10 mL) (3)
Distilled water 10 mL vial (labeled as furosemide 10 mg/mL)
Distilled water 10 mL vial (labeled as isoproterenol 1 mg/mL)
Distilled water 10 mL vial (labeled as lidocaine 2%)
Distilled water 10 mL pre-filled syringe (labeled as morphine 10 mg/mL) (2)
Distilled water 0.7 mL pre-filled syringe (labeled as morphine 10 mg/mL auto-injector) (2)
Distilled water 2 mL pre-filled syringe (labeled as diazepam 5 mg/mL) (5)
Distilled water 50 mL pre-filled syringe (labeled as sodium bicarbonate 8.4% 84 mg/mL)
Distilled water 1 mL vial (labeled as vasopressin 20 units/mL) (2)
Distilled water 1 mL vial (labeled as methylprednisolone 125 mg/mL)
Distilled water 10 mL pre-filled syringe (labeled as 0.9% normal saline flush) (6)
Distilled water 2 mL vial (labeled as diphenhydramine 25 mg/mL) (2)
Distilled water 10 mL pre-filled syringe (labeled as calcium chloride 10% 1 g/10 mL) (2)
Distilled water 1 mL vial (labeled as ceftriaxone 1 gm/mL)
Distilled water 5 mL vial (labeled as dexamethasone 4 mg/mL)
Distilled water 50 mL pre-filled syringe (labeled as dextrose 50% 0.5 g/mL)
Distilled water 1 mL pre-filled syringe (labeled as epinephrine 1:1000 1 mg/mL) (3)
Distilled water 10 mL pre-filled syringe (labeled as epinephrine 1:10,000 1 mg/10 mL) (3)
Distilled water 10 mL vial (labeled as furosemide 10 mg/mL)
Distilled water 1 mL pre-filled syringe (labeled as glucagon 1 mg/mL)
Distilled water 3 mL pre-filled syringe (labeled as pralidoxime chloride auto-injector 600 mg/2 mL) (3)
Distilled water 2 mL vial (labeled as promethazine 25 mg/mL (2)
Distilled water 1 mL vial (labeled as naloxone 0.4 mg/mL) (5)
Distilled water 2 mL pre-filled syringe (labeled as midazolam 5 mg/mL) (2)
Distilled water 5 mL pre-filled syringe (labeled as magnesium sulfate 10% solution 2.5 g/5 mL)
Distilled water 10 mL pre-filled syringe (labeled as magnesium sulfate 10% solution 5 g/10 mL)
Simulated pills (labeled as acetaminophen 500 mg, aspirin 81 mg x 2, meloxicam 15 mg, nitroglycerin

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0.4 mg x 2) (6)
IV bags with distilled water (250 mL or 500 mL) (4)
Syringes (20)

Oxygen, Airway and Ventilation Supplies

Oxygen source
Oxygen flowmeter
Oropharyngeal/nasopharyngeal airways (various sizes)
Endotracheal tubes and stylets (6.5 to 7.5) (2 each)
Laryngoscope with Miller and Mac Blades (#3 or #4)
10 mL syringe
Supraglottic airway device (#3 or #4)
Dual-lumen devices as desired (various)
Endotracheal restraints or tape
CO2 detector
Adult bag valve mask
Pocket facemask
Oxygen source
Nasal cannula with non-rebreather mask
Silicone lubricant
14 Fr nasogastric tube

Suction Equipment and Supplies

Suction equipment and catheters (various)

Dressing Supplies

2x2 or 4x4 dressing to cover the IV site

Genitourinary Supplies

14 Fr urinary catheter
Distilled water with 1 drop of yellow food coloring for urine source
Urinary drainage bag

Gastrointestinal Supplies

16 Fr nasogastric tube

Miscellaneous

Stethoscope
BP cuff adapted for use with simulator
Non-sterile gloves (1 box)
Sharps container
Patient identification band
Patient chart with appropriate forms and order sheets
Goggles
Gown
Mask
Audio and visual recording devices
Emergency Medications or Crash Cart
12-lead ECG Tracing
X-ray films
Printed lab values
Run Report or Code Blue Record

Monitors Required

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ECG
NIBP
SpO2

Notes

Facilitator Notes

This SCE was created with the patient James Justice, and only this patient can be used. The physiological values documented indicate appropriate and timely interventions. Differences will be encountered when care is not appropriate or timely.

If using the Muse platform, don't hit Run until you are ready to start the scenario. If using the HPS6 platform, open the patient and scenario directory. Do not open the scenario until you are ready to start the simulated clinical experience.

Learners should perform an appropriate physical exam, and the facilitator or patient should verbalize physical findings the learner is seeking but not enabled by the simulator (such as pain on palpation). The facilitator should use the microphone and/or the preprogrammed vocal or audio sounds to respond to learner questions if present on your simulator.

Where appropriate, do not provide information unless specifically asked by learner. In addition, ancillary study results (e.g., ECG, chest x-ray, labs) should not be provided until the learner requests them.

If the patient becomes unconscious in the SCE, remember the patient stops speaking.

It is important to moulage the simulator to enhance the fidelity, or realism, of the simulated clinical experience. For this patient, Dress the simulator in casual clothing and place the simulator in a sitting or supine position and place the simulator on the ground.

When the learner initiates cardiac monitoring, the tracing and heart rate appear on a real ECG monitor for those simulators with this feature. For simulators without ECG monitoring, have the learner apply ECG electrodes to the mannequin and attach the leads. Once all 3 or 5 leads are in place, reveal the TouchPro or Waveform display ECG tracing.

Place a code cart either outside of the room or away from the patient area in the room to allow the secondary nurse to retrieve it and bring it to the bedside, if needed. Have a code cart and either an automated external defibrillator or a defibrillator with the code cart

For simulators without the jugular venous distention or trismus feature, when present, the facilitator should verbalize the presence of these conditions to learners.

Simulation center personnel should play the following roles:

Healthcare provider

Make a patient chart with the appropriate written order forms, MARs, diagnostic results, etc. for learners to utilize. The chart should include the specific patient identification information.

Have the learners roleplay inter-professional communication by reporting the patient's response to interventions. If the data presented is disorganized or missing vital components, have the healthcare provider become inappropriate in response. Emphasize the importance of data organization and completeness when communicating.

Roleplay intra-professional communication by having the learner hand off to the admitting or transferring unit or have the learner hand off to the next shift.

When learners apply and/or titrate oxygen, the facilitator should open the Oxygen Intervention Option or Treatment Scenario and choose the appropriate flow rate. If using the HPS, no software command is necessary when real oxygen is applied.

When learners provide pharmaceutical interventions, the facilitator should open the Medication Intervention Option or Treatment Scenario and choose the appropriate medication. If using the drug recognition feature of the HPS, no software command is necessary when a drug is administered using that system.

When learners provide IV fluid interventions, the facilitator should open the Intervention Option or Treatment Scenario and choose the appropriate fluid and volume to be administered.

Debriefing and instruction after the scenario are critical. Learners and instructors may wish to view a videotape of the scenario afterward for instructional and debriefing purposes.

Debriefing Points

The facilitator should begin by introducing the process of debriefing:
Introduction: Discuss faculty role as a facilitator, expectations, confidentiality, safe-discussion environment
Personal Reactions: Allow students to recognize and release emotions, explore student reactions
Discussion of Events: Analyze what happened during the SCE, using video playback if available
Summary: Review what went well and what did not, identify areas for improvement and evaluate the experience

Questions to be asked during debriefing:
What was the experience like for you?
What happened and why?
What did you do and was it effective?
Discuss your interventions (technical and non-technical). Were they performed appropriately and in a timely manner?

How did you decide on your priorities for care and what would you change?
How did patient safety concerns influence your care? What did you overlook?
In what ways did you personalize your care for this patient and family members (recognition of culture, concerns, anxiety)?
Discuss your teamwork. How did you communicate and collaborate? What worked, what didn't work and what will you do differently next time?
What are you going to take away from this experience?

Teaching Q & A

State 1 Pneumothorax:

Why are no lung sounds heard on the left side?
Lung sounds are absent because the patient has just ruptured a bleb. A bleb is a weakness in the lining of the lung. If a patient has a bleb, air can be trapped in the pleural space, making it hard to ventilate and for oxygen exchange to take place.

State 2 Tension Pneumothorax:

Why did the patient have a tension pneumothorax?
Because the simple pneumothrax was not treated and pressure built up, creating the tension

State 3 Needle Decompression:

Why did the needle decompression correct the problem?
By letting the trapped air escape from the pleural space, making it easier for the patient to breathe

References

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