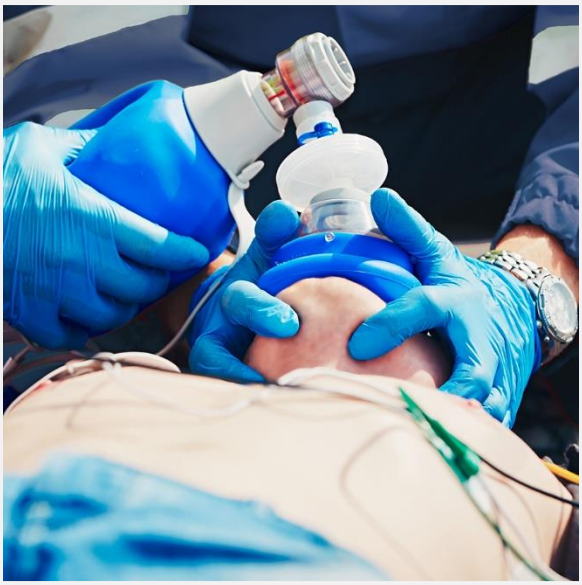
VIRTUAL VENTILATOR

GAME 3: FACULTY GUIDE

Estimated Time: 30 minutes



Scan to Begin

Patient Name: Samuel Carlson

SCENARIO OVERVIEW

In Game 3 of the **ARISE Virtual Ventilator Serious Game** series, students here report the following report: “This is ARISE EMS calling to notify you that we will be arriving to your ER in about 10 minutes with a 16-year-old male who was found down in the parking lot of the local high school after track practice. When we arrived on the scene bystanders had attached an AED and, according to them, he was shocked at least twice. He was shocked one more time after we arrived and regained a pulse at that time. They stated his arrest was witness by several people including a Coach who immediately started CPR. According to the Coach, the AED was attached within about 5 minutes. He is intubated, has two large bore IV, and has received 3 mg of epi so far. He is about 5 feet 9 inches tall and weighs about 75 kilos. Please advise as to the room we will be arriving to.”

INSTRUCTIONS

There are four levels for students to complete in this serious game. See the **ARISE Virtual Ventilator Serious Game: Overview** and the **ARISE Virtual Ventilator Serious Game: Student Handout – Game 3** for detailed instructions.

LEARNING OBJECTIVES

1. Select correct mechanical ventilator settings according to NBRC standards
2. Apply correct mechanical ventilator settings to the ARISE Virtual Ventilator according to NBRC standards
3. Set patient specific mechanical ventilator alarms on the ARISE Virtual Ventilator according to NBRC standards
4. Given patient ventilator parameters, calculate static compliance, dynamic compliance, airway resistance, and I:E ratio

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 standards3

RESPIRATORY LIFE SUPPORT

- Explain the general principles of mechanical ventilation
- Apply invasive mechanical ventilation
- Operate various ventilators
- Evaluate patient response to mechanical ventilation

ANSWER KEY

The answers for each level of Game 3 are as follows:

- Level 1: Students must correctly choose the ventilator settings for this patient according to NBRC standards. Given the available patient information, the correct ranges are as follows:
    - Rate = 10 - 16 bpm

  - Tidal Volume = 435 – 585 ml
  - O2 % = 50 – 100%
  - PEEP = 5 – 7 cmH2O

- Level 2: Students must correctly enter their chosen settings on the ARISE Virtual Ventilator. If they enter settings within the ranges listed above, they will be correct.
  - Students may adjust Flow and I Time settings, but they are not connected to programming or checked against any parameters during the game.

- Level 3: Students must correctly enter patient appropriate ventilator alarms on the ARISE Virtual Ventilator according to NBRC standards. Given the ARISE Virtual Ventilator patient outputs, alarms should be set as follows:
  - Pressure alarm: Maximum = 34 – 40 cm H2O and Minimum = 15 – 21 cm H2O
  - Rate alarm: Maximum = 18 – 30 bpm and Minimum = 4 – 12 bpm
  - VE alarm: Maximum = 11 – 15 lpm and Minimum = 2 – 4 lpm
  - Apnea alarm: < or = to 20 seconds

- Level 4: Students must correctly calculate the Static Compliance, Dynamic Compliance, Airway Resistance, and I:E Ratio using a pre-filled ventilator flowsheet.
  - Static Compliance = 16.2 – 16.4 ml/cmH2O
  - Dynamic Compliance = 15.3 – 15.5 ml/cmH2O
  - Raw = 2.5 – 2.7 cmH2O/L/sec
  - I:E ratio of set rate = 1:4.5 to 1:4.7

SCORING

The **ARISE Virtual Ventilator Serious Games** programming keeps track of how many attempts it takes a student to pass each level. The programming scores students based on the ratio of the number of remaining attempts to the total available attempts. If a student achieves 75% or greater, they have passed that serious game. However, a student can complete the game and not pass it. Thus, at the end of each serious game, a screen is displayed on the iPad with those results, a timestamp, and instructions on how to take a screenshot. Students can submit this screenshot to their instructor as “evidence” of completion. In addition, since this screenshot includes the number of failed attempts for each level, faculty can evaluate the data to determine if and where further instruction and/or practice is required. An example table is as follows:

Scorable Serious Game Levels	Failed Attempts
Level 1: Suggested Ventilator Settings	1
Level 2: Enter Ventilator Settings	0

Level 3: Set Ventilator Settings	2
Level 4: Perform Calculations	0
Total Score	9/12

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

CREDITS

Images purchased from Shutterstock.

REFERENCES

Persing, G. (2016). Respiratory Care Exam Review (4th ed.). St, Louis, Missouri: Elsevier.

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