

RespiSim QuickChoice Asthma Scenario Notes

This handout is intended as a companion to the RespiSim Software 3.6 Video Tutorial [“Using the QuickChoice Menu.”](#)

Patient Background

1. 18 year old male, 6’5” tall (196 cm)
2. Arrived in the emergency room with shortness of breath, use of accessory muscles, and bi-lateral wheezing
3. Placed on a continuous nebulizer and BiPAP
4. After 2 hours with no improvement, the patient is intubated and placed on the ventilator for an asthma exacerbation

Set the initial patient conditions on the RespiSim QuickChoice Menu

1. Activate asthmatic patient
2. Click ‘Adult,’ ‘Asthma,’ and ‘Severe’
3. Click ‘Activate Current Selection’
4. Click ‘Start Simulation’
5. Save your data file with a new name
6. Check the box next to Save Waveform Data
7. Click ‘OK’

Connect the ASL 5000 Breathing Simulator to the ventilator

- Directly to the 22mm port on the front of the ASL 5000
- Or intubate your RespiPatient manikin and connect the ventilator to the ET Tube

View the parameters used for this severe asthmatic model by clicking ‘View Current Model’. We can see our patient has:

1. A high inspiratory resistance (50 cmH₂O/L/s)
2. A very high expiratory resistance (120 cmH₂O/L/s)
3. Is breathing spontaneously at a rate of 35 bpm

Create a ventilator problem for the learner to solve

Settings:

1. Volume control mode (For example, S-CMV)
2. Inspiratory time of 1.2
3. Rate of 30 bpm
4. Tidal volume of 350 cmH₂O
5. PEEP of 10 cmH₂O

Bring the learner into the room

First, the learner should make some initial observations on the ventilator.

1. Patient is clearly dysynchronous with the ventilator
2. High peak pressures (40-43 cmH₂O)
3. I:E ratio of about 1:1 which is indicative of an asthma exacerbation
4. Total breath rate is above the set rate which shows that the patient is breathing spontaneously
5. Evidence of air trapping

Patient's vital signs

Enter values to provide information on our vital signs monitor.

Heart Rate: 170

SpO₂: 82%

Blood Pressure: 160/110

etCO₂: 60

We can see that this patient is tachycardic, hypertensive, and hypoxemic. The patient's end tidal CO₂ should provide further evidence of air trapping.

Learner adjusts ventilator

After assessing the patient, the learner decides to switch the mode to pressure control (P-CMV) and administer continuous albuterol.

The learner decides to set an

1. Inspiratory time of .6
2. Breath rate of 20 bpm
3. Inspiratory pressure of 26 cmH₂O
4. PEEP of 10 cmH₂O

See improvements on ventilator

1. Patient is more synchronous with the ventilator and the peak pressures are no longer exceeding the alarm limit
2. I:E ratio has improved to almost 1:2 as well

Fast forward 6 hours

To simulate that the continuous nebulizer has led to an improvement in the patient's condition

1. Select the 'Mild' asthma model
2. Click 'Activate Current Selection'

New ventilator data shows alarms for High Tidal Volume and Minute Ventilation due to the improved lung mechanics.

Learner adjusts ventilator again

1. Inspiratory time .8
2. Breath rate 15 bpm
3. Inspiratory pressure 16 cmH₂O

The peak pressures have dropped further to a safe level (approx. 18 cmH₂O). The tidal volume and minute ventilation are now in an acceptable range as well.

Improved Patient's vital signs.

Enter values to provide information on our vital signs monitor.

Heart Rate: 95

SpO₂: 93%

Blood Pressure: 125/85

etCO₂: 46

Heart rate and blood pressure have dropped to safer levels, and the etCO₂ shows less evidence of air trapping.