

Scenario Information

Trigger Dysynchrony in VC-AC

Duration

15 minutes

Scenario Overview

This case is an advanced scenario that addresses missed triggers while ventilating a patient with COPD in VC-AC. The user will identify improperly set trigger sensitivity and AutoPEEP. The focus will be to properly set the trigger sensitivity to eliminate missed triggers. The learner will increase the set PEEP to counterbalance the AutoPEEP, which will minimize the missed triggers. The learner will also identify the effects of the changes to these ventilator settings on respiratory cycle times, pressures, as well as volumes, which correlate to a lab worksheet provided with this scenario.

Learning Goals and Objectives

Learning Goals

1. Identify missed triggers by evaluating the graphic waveforms and displayed parameters.
2. Identify and correctly set improperly set trigger sensitivity.
3. Identify AutoPEEP by evaluating the graphic waveforms.

Learning Objectives

1. Suggest and implement methods of reducing airway resistance to minimize AutoPEEP and missed triggers.
2. Suggest and implement methods of increasing expiratory time to minimize AutoPEEP and missed triggers.
3. Adjust PEEP to counterbalance AutoPEEP and minimize missed triggers.

Learner Name: _____

Specific Scenario Tasks

Actions and Critical Thinking Skills to be Addressed

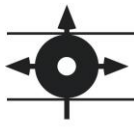
1. Missed triggers

- a. Poorly set sensitivity- Change trigger
 - i. Pressure 1 cmH₂O or Flow 2–3 LPM
- b. AutoPEEP- Reduce airway resistance
 - i. Give bronchodilator
 - ii. Suction
 - iii. Larger ETT
- c. Make expiratory time longer
 - i. Decrease inspiratory time
 - ii. Decrease respiratory rate
- d. Increase PEEP to counterbalance autoPEEP
 - i. Increase 1 or 2 cmH₂O, slowly, until patient is able to trigger ventilator



1. Scenario setting and report hand-off

- a. Bob Stevens is a 72 year old, 5'9", 225 pound male who presented to the Emergency Department with increasing shortness of breath. He has a history of COPD, having been admitted four times in the last 12 months. His wife states that the grandkids visited last week and two of them had colds. For the past four days, Bob has had a productive cough, fever and increasing shortness of breath. He has used his rescue inhalers every four hours for the past two days.
- b. After transferring to the ICU, he was placed on oxygen via High Flow Nasal Cannula set at 50% oxygen and 40 LPM. His work of breathing and dyspnea did not decrease significantly, so he was ventilated noninvasively. Noninvasive ventilator settings were Peak Inspiratory Pressure 12 cm H₂O, End Expiratory Pressure 5 cm H₂O, FIO₂ 0.5. After two hours of trying Noninvasive Positive Pressure Ventilation, it appeared that he was beginning to have signs of fatigue. The physician discussed the options, which include comfort care and invasive ventilation; Bob and his wife were adamant that they wanted to try invasive ventilatory support.
- c. You are asked to set up the ventilator for ventilatory support after he is successfully intubated with a 7.5 mm endotracheal tube.



1. Record the baseline values and measurements in the appropriate spaces provided.

TCT= 60/RR

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{or} P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

2. Record the new values and measurements in the appropriate spaces provided after changes are made.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{or} P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

If additional settings were changed, add here:

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{or} P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

What values have changed and why?

Four hours later

3. Record current values.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

4. Record the new values and measurements in the appropriate spaces provided after changes are made.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

If additional settings were changed, add here:

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

What values have changed and why?

Six hours later

5. Record current values.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O



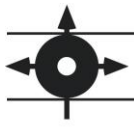
6. Record the new values and measurements in the appropriate spaces provided after changes are made.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{or} P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

If additional settings were changed, add here:

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{or} P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

What values have changed and why?



Two hours later

7. Record current values.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

8. Record the new values and measurements in the appropriate spaces provided after changes are made.

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

If additional settings were changed, add here:

Baseline Values										
PIP cmH ₂ O	Pplat cmH ₂ O	(Pplat - PEEP) cmH ₂ O	VT _E mL	Set flow and shape LPM	Trigger & value V̇ _{O₂} or P	Set RR	Total RR	MV mL	PEEP cmH ₂ O	Auto PEEP cmH ₂ O

What values have changed and why?

1. Is the condition of the patient at the end of the simulation satisfactory?
2. How is trigger dysynchrony recognized utilizing the scalar waveforms on the ventilator?
3. What are the two causes of trigger dysynchrony?
4. What are the ways in which a ventilator may be triggered into inspiration?