



## Improving Diaphragmatic Fatigue with Proportional Assist Ventilation

Presenter: Britney Kristiansen, GRT

December 1, 7:00 PM Eastern

### Session Abstract

The diaphragm is an important muscle for inspiration as it helps to maintain adequate ventilation. While the diaphragm is crucial in voluntary breathing, during mechanical ventilation the diaphragm's ability to work is taken away, leading to myotrauma. Mechanical ventilation plays a detrimental role in diaphragmatic atrophy within just six hours of initiation of mechanical ventilation. With the diaphragm atrophying, it also showed that inflammation occurred within the diaphragm increasing the thickness of the diaphragm and overall tissue edema. A cohort study in 2018 showed that nearly two-thirds of patients that were mechanically ventilated developed early rapid changes to the thickness of their diaphragm.

With this occurring, the ability to have a patient perform their own breathing when they are ready to be weaned from the ventilator is extremely difficult due to the diaphragm's inability to perform up to the needs of the patient. With the inability for the patients to be weaned within a timely manner from mechanical ventilation because of the diaphragmatic atrophy occurring this led to prolonged ventilation, prolonged ICU time and increased risks of ventilator induced pneumonia, re-intubation and tracheostomy. The diaphragm is an important muscle in being able to liberate patients from mechanical ventilation, which is how proportional assist ventilation (PAV) comes into action. PAV is not a well understood mode but there have been clinical studies that have proven how PAV has improved patient outcomes and overall life.

PAV is a spontaneous mode that is able to improve the diaphragm atrophy, that occurred with conventional ventilation, by making the patient work as much or as little as possible on a breath to breath basis. PAV works on a positive feed-back loop by consistently measuring the patient's resistance and compliance and ability to work the ventilator is able to give that amount of work back to the patient without the means of exhausting them. PAV has been shown to help improve respiratory muscle fatigue specifically of the diaphragm, to be able to liberate patients from mechanical ventilation because of its ability to push the patient to work and make the diaphragm work as opposed to other spontaneous ventilation modes.

### Session Objectives

1. To learn more about the diaphragm and its overall importance
2. To learn how mechanical ventilation has a dramatic effect on the diaphragmatic muscles
3. To learn how conventional mechanical ventilation impairs the diaphragm from doing any kind of work
4. To learn how proportional assist ventilation has improved diaphragmatic fatigue as compared to other forms of ventilation.

### Speaker Biography

Britney recently graduated from the SAIT Respiratory Therapy program and is working in Saskatoon with the Saskatchewan Health Authority. She is from Saskatoon, SK and has always lived there except for the years spent in Calgary for schooling. She went to the University of Saskatchewan right out of high school in 2015, but decided to go into Respiratory Therapy after discovering more about the career and being around it more with her grandmother having COPD. She has always wanted a career in the health care field, so once discovering what Respiratory Therapy was, she wanted to jump onboard with it. She lives an extremely active lifestyle; has played flag football and soccer since she was young and grew up bowling competitively, which she hoping to get back into! She coaches flag football as well in the spring time. She has spent time volunteering with McDonald's McHappy Day over the past few years as well as with a young girl with Cystic Fibrosis.