

2014 OPEN FORUM

Presented by

RESPIRATORY CARE

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The OPEN FORUM at the AARC Congress 2014 is an unique opportunity for attendees to experience the results of scientific studies performed by their colleagues. RESPIRATORY CARE is proud to present this year's OPEN FORUM. Once again, respiratory care professionals have stepped forward and analyzed the things they do with critical eyes. For the first time ever, this year posters will be presented in one of 3 formats:

Editors' Choice – The top 6 abstracts in 2014. On the first two days of the Congress the Editors' Choice posters will be displayed by the entrance to the Exhibit Hall. On the third day, each presenter will discuss their findings in a 10-minute slide presentation, which will be followed by a 10-minute question and answer period.

Poster Discussions – Sixteen sessions, grouped by topics, will be presented over the four days of the Congress. During the first part of the session attendees will be able to review the posters and discuss them with the authors. In the second part presenters will expand on the work shown on the poster with a brief oral presentation (no slides).

Posters Only – Posters will be displayed inside the Exhibit Hall during the three days of exhibits. Different categories each day. Authors will be present for questions and answers from 12:00 pm to 1:30 pm.

OPEN FORUM Sessions

Tuesday, December 9

Posters Only #1 11:30 am – 3:30 am	Neonatal/Pediatric Ventilation/Ventilators
Poster Discussions #1 3:15 pm – 5:10 pm	Aerosols/Drugs – Part 1
Poster Discussions #2 3:15 pm – 5:10 pm	Monitoring/Equipment – Part 1

Wednesday, December 10

Poster Discussions #3 10:00 am – 11:55 am	Ventilation/Ventilators – Part 1
Poster Discussions #4 10:00 am – 11:55 am	Diagnostics
Posters Only #2 10:30 am – 2:30 pm	Aerosols/Drugs Asthma/Pulmonary Disease Case Reports Home Care Sleep/Pulmonary Rehab O ₂ Therapy
Poster Discussions #5 12:30 pm – 2:25 pm	Neonatal/Pediatric – Part 1
Poster Discussions #6 12:30 pm – 2:25 pm	Education – Part 1
Poster Discussions #7 3:10 pm – 5:05 pm	Asthma/Pulmonary Diseases
Poster Discussions #8 3:10 pm – 5:05 pm	Home Care/O ₂ Therapy

Thursday, December 11

Poster Discussions #9 9:30 am – 11:25 am	Aerosols/Drugs – Part 2
Poster Discussions #10 9:30 am – 11:25 am	Management
Editors' Choice 9:30 am – 11:55 am	Top 6 abstracts in 2014
Posters Only #3 10:30 am – 2:30 pm	Airways Care Diagnostics Education Management Monitoring/Equipment
Poster Discussions #11 12:30 pm – 2:25 pm	Airways Care
Poster Discussions #12 12:30 pm – 2:25 pm	Ventilation/Ventilators – Part 2
Poster Discussions #13 3:15 pm – 5:10 pm	Case Reports
Poster Discussions #14 3:15 pm – 5:10 pm	Education – Part 2

Friday, December 12

Poster Discussions #15 9:00 am – 10:55 am	Neonatal/Pediatric – Part 2
Poster Discussions #16 9:00 am – 10:55 am	Monitoring/Equipment – Part 2

See pages OF83-OF89 for OPEN FORUM Author Index

The Journal and the OPEN FORUM organizers are not responsible for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions or ideas contained in the abstracts published here. Advances in the medical sciences occur every day and we strongly recommend independent verification of treatment modalities, diagnoses and drug usages.

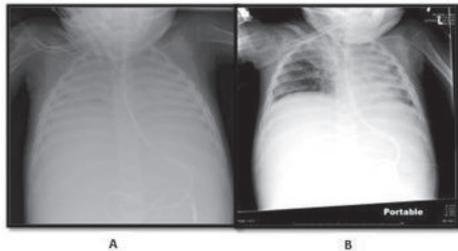
2020582

THE USE OF COMBINED NEGATIVE AND POSITIVE PRESSURE VENTILATION IN TREATING SEVERE ARDS AND AIR LEAK SYNDROME WHILE ON ECMO.

Michael Le¹, Kevin Bullock¹, Craig D. Smallwood¹, Danielle Decourcy²; ¹Respiratory Care, Boston Children's Hospital, Boston, MA; ²Medicine Critical Care, Boston Children's Hospital, Boston, MA

INTRODUCTION: Respiratory management of a patient with ARDS that has developed air leak syndrome is challenging because while positive pressure ventilation (PPV) is used to maintain lung function (FRC), it can also lead to iatrogenic lung trauma. We report a case of an individual with severe ARDS and a history of pneumomediastinum and pneumothorax in whom we were able to apply PPV and negative pressure ventilation (NPV) to increase aeration without promoting air leak. **CASE REPORT:** A 13 month old child with a recent diagnosis of acute lymphocytic leukemia (ALL) developed respiratory syncytial virus (RSV) and required venoarterial ECMO due to persistent hypoxia, hypercarbia, and air leak. After 3 weeks on ECMO, the patient continued to have complete opacification of both lung fields and persistent air leak despite total lung rest and intermittent incremental increases in positive pressures in an attempt to recruit the lungs. Continuous negative pressure (CNEP) of -25 cm H₂O along with intermittent secretion clearance was added using the Hayek RTX Respirator (United Hayek) to aid in lung recruitment. Initially, the patient's VT was 3 mL and Cdyn 0.30 mL/cm H₂O (see figure A). After 48 hours, aeration improved bilaterally on PCIMV: PIP 20 cm H₂O, PEEP 10 cm H₂O, f 14 breaths/min with CNEP -25 cm H₂O (VT 20 mL; Cdyn 2.0 mL/cm H₂O) with no evidence of further air leak (see figure B). After 53 days of ECMO, this patient was successfully decannulated from ECMO. **DISCUSSION:** Despite providing ECMO, total lung rest, and intermittent recruitment using positive pressure ventilation, adequate aeration could not be achieved without exacerbating air leak. CNEP, using an external noninvasive chest cuirass in conjunction with PPV, may have allowed for improved chest wall compliance as well as a more uniform distribution of ventilation. CNEP in conjunction with PPV may be considered as an adjunct recruitment modality for ECMO patients with complete bilateral opacification and persistent air leak.

Sponsored Research - None



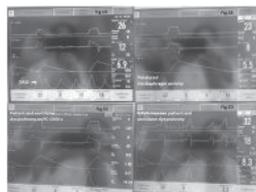
2023033

NEURALLY ADJUSTED VENTILATORY ASSIST VENTILATION (NAVA) FOR MANAGEMENT OF RESPIRATORY FAILURE IN A COPD EXACERBATION.

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Introduction: Mechanical ventilation (MV) has evolved since its introduction in managing patients with respiratory failure. The prognosis of critical ill patients with respiratory failure depends on their underlying etiology, and the strategy used for mechanical ventilation. Neurally adjusted ventilator assist (NAVA) is one of the newest developments in MV. It is an assisted mode of MV which uses the electrical activity of diaphragm (EAdi) to trigger the ventilator breath. This allows breath to breath assessment of ventilator assist and thus improvement of patient ventilator asynchrony. **Case Report:** 58 year old male with past medical history of hypertension, >40 pack yr former smoker and very severe COPD with FEV1 of 15%, admitted with acute hypercapnic respiratory failure at outside hospital requiring intubation. On presentation he was intubated and sedated remained desynchronized with the ventilator, afebrile, BP 134/96, Pulse 84/bpm regular. Poor air entry bilateral with wheezes but no crackles or JVD Labs were significant for Hb of 10.8, HCO 31, ABG 7.31/65/107/32/97 on 40% FIO₂ on ventilator. CXR showed hyperinflation. Initial ventilator settings were PC-CMV with Inspiratory pressure (IP):15, PEEP:12, Peak pressure(Ppeak):27mmHg, mean pressure(P-mean):15mmHg, AutoPEEP 15mmHg after paralysis and static compliance was 129 lit/cm H₂O. He was placed on NAVA with levels between 2-5cm H₂O/ μV, EAdi peak 8-18μV, PEEP +8mmHg, Ppeak 32mmHg and Pmean 13mmHg. The airway pressures didn't change significantly however; it improved patient ventilator desynchrony and decreased work of breathing. **Discussion:** Patient ventilator asynchrony is common and presents in 25% of MV patients and can lead to increased need for sedation and neuromuscular blockade, barotrauma, ventilator induced lung injury and prolong need for MV. The presence of intrinsic PEEP and dynamic hyperinflation as seen in our patients with COPD can lead to ineffective triggering. NAVA utilizes EAdi signals to determine the timing and level of ventilator assist resulting in synchrony between the ventilator flow and neural respiratory cycle. Until now there are no clinical trials suggesting its role in improving outcome. However, improving asynchrony has been shown in various physiological studies in animal and healthy individuals. NAVA is a new promising tool for clinician and researchers in the field of MV. Future trials needed to evaluate its indications and effectiveness in improving outcome.

Sponsored Research - None



Synchrony waveforms

2021247

POST-ICU MECHANICAL VENTILATION: OUTCOMES OF THE REVISED THERAPIST-IMPLEMENTED PATIENT-SPECIFIC (TIPS) WEANING PROTOCOL.

Glenn Payne¹, Douglas Vela¹, Meg Hassenpflug¹, David R. Nelson¹, Scott A. Sasse¹, Jillisa Steckart^{1,2}; ¹Barlow Respiratory Hospital and Research Center, Los Angeles, CA; ²VA-GLAHS, Los Angeles, CA

Introduction: Barlow Respiratory Hospital (BRH) is a 105-bed long-term acute care (LTAC) hospital network that serves as a regional weaning center, accepting chronically critically ill (CCI) patients transferred from the ICUs of hospitals in southern California. Patients have been weaned using the Therapist-Implemented Patient Specific (TIPS©) weaning protocol since 1998 (CHEST 2001; 119:236-242). Herein we report weaning outcomes after the implementation of our most recent revision of the protocol compared to outcomes of the previous calendar year. **Method:** An interdisciplinary task force was formed to review existing protocol and seek opportunities for improvement. Literature review was performed to update evidence base of ICU and LTAC weaning practices, stability and weaning parameters, ventilator modes, and other protocols. Input was solicited from staff pulmonologists and other key stakeholders. Protocol revisions were drafted, circulated, and discussed; expert opinion was utilized for decisions lacking a true evidence base. EHR documentation was updated to reflect protocol revisions and provide data for compliance monitoring. After training of all staff, revised protocol was applied to patients admitted from 3/3/2014 forward. Outcomes (weaned, vent-dependent, died) were scored at BRH discharge for both cohorts; weaned defined as patient being free of invasive mechanical ventilation for at least one full calendar day prior to day of discharge. **Results:** Two key protocol revisions were realized to "accelerate" weaning: 1) daily rapid shallow breathing index (RSBI) measurements to assess for earliest opportunity to advance to self-breathing trials, and 2) up to three daily reassessment opportunities to advance multiple steps in the protocol. From 3/3/2014-5/28/2014 33 CCI patients admitted for weaning reached outcome. These preliminary results are compared to 297 CCI patients treated by the same physicians and staff in 2013. **Conclusions:** These very preliminary results show a significant decrease in time to wean after implementation of revised weaning protocol incorporating additional "acceleration" steps while maintaining conservative safety and stability screens. Fewer days on mechanical ventilation may translate to less risk of ventilator-associated events/infection, enhanced rehabilitation opportunities, and shorter lengths of stay. Continued rounding, reinforcement of education, and compliance monitoring will inform these findings. **Disclosures:** None

Sponsored Research - None

2025306

A CASE STUDY: USE OF BIPHASIC CUIRASS VENTILATION UPON DIAGNOSIS OF AMYOTROPHIC LATERAL SCLEROSIS.

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Introduction: A 68 year old white female was admitted to a sub-acute care rehabilitation facility after undergoing spinal cervical decompression surgery. The patient achieved minimal response to rehabilitation and was admitted to a long-term care facility. **Case Summary:** The patient was evaluated by neurology for progressive upper limb and respiratory muscle weakness. The evaluation resulted in a diagnosis of amyotrophic lateral sclerosis (ALS), a terminal disorder of unknown origin that is complicated by gradual reduction in lung volumes, impaired cough, speech and respiratory failure the principal cause of death. Pulmonary consultation recommended Biphasic Cuirass Ventilation™ (BCV), (Hayek Medical, London, UK), a method that uses a non-invasive cuirass (shell), connected to a module which actively controls both phases of respiration cycle. BCV is designed to increase functional residual capacity, promote airway clearance and cough assistance. A didactic and hands-on competency review was provided to the nursing staff. BCV was ordered every 6 hours for duration of 15 to 30 minutes per session as tolerated and received therapy daily for a period of 52 days. Respiratory parameters were measured daily pre and post therapy for 28 days by Pulmonary Services. Parameters were averaged and percent change documented in the medical record. **Discussion:** In this case BCV was initiated upon diagnosis of ALS improving the patient's tidal volume (363 ml É 34 %), vital capacity (0.950 L É 19 %), decrease in respiratory rate (17 BPM Ñ 37%), improved comfort and tolerance between the equipment and patient interface. The nursing staff found BCV to be user-friendly and efficient in reducing the labor intensiveness of administering deep breathing exercise, chest physical therapy and cough assistance. We infer given the terminal nature of ALS and eventual respiratory failure, the early introduction of BCV may assist in establishing a Segway that "bridges" improvement in the patient's compliance and tolerance of the device. BCV also provided in this case greater comfort by not having to wear a full face BIPAP mask that prevents verbal communication as well as increasing the risk of facial tissue breakdown. Another added advantage is the delay BCV provides in the inevitable need for a tracheostomy and conventional mechanical ventilation. **Resource:** Cuirass Ventilation: A review and Update. Critical Care and Resuscitation 2004; 6: 113-122 **Sponsored Research - None**

Sponsored Research - None



Cuirass (Shell) and Power Monitor