



CANADIAN SOCIETY OF RESPIRATORY THERAPISTS
SOCIÉTÉ CANADIENNE DES THÉRAPEUTES RESPIRATOIRES

Posters from the Canadian Society of Respiratory Therapists 2020 E-Conference Series

We are pleased to present abstracts from the poster presentations that were displayed virtually in October 2020 as part of the CSRT E-Conference Series, which ran from July to December 2020. As evidenced by the following abstracts, the work of our colleagues in 2020 highlights current research and practice innovations led by respiratory therapists and students.

The editorial board looks forward to receiving manuscripts from this conference for consideration for publication in the *Canadian Journal of Respiratory Therapy* to continue building the body of knowledge specific to our profession. Please note these abstracts have not been peer reviewed.

RT POSTERS

WINNER (RT CATEGORY)

01

NON-INVASIVE HIGH FREQUENCY OSCILLATORY VENTILATION IN PRETERM INFANTS WITH RESPIRATORY DISTRESS SYNDROME

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Background: Non-invasive ventilation (NIV) is used to avoid invasive mechanical ventilation (IMV) and associated complications in preterm infants with respiratory distress syndrome (RDS). Clinical experience with invasive high frequency oscillatory ventilation and the trend towards NIV has resulted in non-invasive high frequency oscillatory ventilation (NIHFOV). This review investigates current evidence comparing NIHFOV to other NIV modes in preterm infants with RDS.

Objective: To determine if NIHFOV compared to other modes of NIV decreases the need for IMV, reduces the duration of NIV, and improves PCO_2 levels in preterm infants with RDS. Secondary outcomes include mortality and bronchopulmonary dysplasia (BPD).

Methods: PubMed, CINAHL, Embase, and Cochrane Library were searched. Search terms were “preterm infants,” “respiratory distress syndrome,” and “non-invasive high frequency oscillatory ventilation” or “nasal high frequency oscillatory ventilation.” Filters included a publication date within 10 years, only humans, English articles, and randomized controlled trials (RCTs), systematic reviews (SR), meta-analyses (MA), clinical trials, and practice guidelines as article types.

Results: Five RCTs and two SRs/MAs were retrieved. Five studies compared NIHFOV versus nasal continuous positive airway pressure (NCPAP), one versus biphasic-NCPAP, and one versus both NCPAP or biphasic-NCPAP as a combined intervention. In most studies, NIHFOV significantly reduced IMV ($P < 0.0001, 0.004, 0.133, 0.03, 0.002, 0.003$), duration of NIV ($P = 0.009, 0.02, 0.009$) and CO_2 levels ($P = 0.0007, 0.001, <0.001, 0.002$) compared to NCPAP and NCPAP or biphasic-NCPAP. Mortality and BPD were not statistically different ($P > 0.05$).

Biphasic-NCPAP, when analyzed separately in one RCT, was similar to NIHFOV ($P > 0.05$).

Conclusion: NIHFOV is more effective than NCPAP for decreasing the need for IMV, reducing the duration of NIV, and improving CO_2 clearance in preterm infants with RDS. Mortality and BPD are comparable. Further large, multi-centre, adequately powered trials comparing infants with younger gestational ages, other NIV modes, and appropriate NIHFOV settings are needed.

02

VENTILATORY EQUIVALENT FOR OXYGEN DISTINGUISHES BETWEEN PASSING AND FAILING A SPONTANEOUS BREATHING TRIAL BEFORE EXTUBATION

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Introduction: Weaning predictors can help liberate patients in a timely manner from mechanical ventilation. Ventilatory equivalent for oxygen ($VEqO_2$), a surrogate for work of breathing and a measure of the efficiency of breathing, may be an important noninvasive alternative to other weaning predictors. Our study's purpose was to observe any differences in $VEqO_2$ between extubation outcome groups.

Methods: Employing a metabolic cart, oxygen consumption ($\dot{V}O_2$), minute volume (VE), tidal volume (VT), and breathing frequency were recorded during a spontaneous breathing trial (SBT) to calculate $VEqO_2$ and the rapid shallow breathing index (RSBI) in 34 adult participants in the intensive care unit. Five-breath means of $VEqO_2$ and the RSBI collected throughout the SBT were examined between SBT pass and fail groups and extubation pass and fail groups using the Mann-Whitney U test with $P < 0.05$.

Results: Data from 31 participants were analyzed between SBT outcome groups. Data from 20 participants were examined for extubation outcome after a successful SBT. Median (interquartile range) $VEqO_2$ was not different between extubation groups. Participants who passed the



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SBT had a higher median $\dot{V}E_{O_2}$ than those who did not at the midpoint (25.3 L/L $\dot{V}O_2$ [22–33L/L $\dot{V}O_2$] vs. 23.7 L/L $\dot{V}O_2$ [18–24 L/L $\dot{V}O_2$], $P = 0.035$) and at the end (25.5 L/L $\dot{V}O_2$ [23–34 L/L $\dot{V}O_2$] vs. 21.3 L/L $\dot{V}O_2$ [20–24 L/L $\dot{V}O_2$], $P = 0.017$) of the SBT.

Discussion: $\dot{V}E_{O_2}$ may show differences in SBT outcomes, but not differences between extubation outcomes. $\dot{V}E_{O_2}$ may be able to detect differences in work during an SBT but may not be able to predict change in workload in the respiratory system after extubation. The small sample size may also have prevented any differences in extubation outcomes to be shown.

Conclusion: $\dot{V}E_{O_2}$ was higher in patients that passed their SBT. $\dot{V}E_{O_2}$ was not useful in identifying extubation success or failure in adult mechanically ventilated patients.

03

SLEEP AND CANNABIS USE

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I strongly believe there is a positive connection between cannabis use in relation to sleep. My role as a respiratory therapist for nearly a decade has provided tremendous insight into sleep patterns however, with the recent legalization of cannabis I would like to explore the correlation in more depth. I have compiled a literature review based on recent research to explore the positive effects of cannabis use on sleep, specifically in those with pain, trauma, OSA as well as adolescent use.

Ware et al. [1] found that a single dose of 25mg cannabis inhaled three times daily for 5 days decreased the intensity of pain, improved sleep and was tolerated well. Further, Piper et al. [2] found that among participants that responded with regular opioid use, over three-quarters (76.7%) indicated that they had decreased their opioid use since commencing medical cannabis. Metrik et al. [3] found that when studied concurrently, sleep motives significantly mediated the correlation between PTSD and MDD with cannabis use. Babson et al. [4] suggested that synthetic cannabinoids may have short-term benefit for sleep apnea based on their regulatory effects on serotonin-mediated apneas. While Mike et al. [5] found that both sleep quality and duration in early adolescence may have correlations to the development of alcohol and cannabis use throughout adolescence.

Consistent across the board in the current research, further studies need to be completed to examine the positive and negative effects of cannabis on sleep as it is still new to the table. I would like to further my own knowledge by connecting with physicians, clinical educators and cannabis providers to further explore the links as both topics are extremely interesting to me at this time. As a respiratory therapist, my focus has centered solely around patient care and most of my career has been in a clinical sleep therapist and home care role.

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04

PALLIATIVE CARE AS AN EMERGING ROLE FOR RESPIRATORY HEALTH PROFESSIONALS: FINDINGS FROM A CROSS-SECTIONAL, EXPLORATORY CANADIAN SURVEY

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Introduction: Respiratory Health Professionals (RHPs) with specialty training in the management of asthma and COPD, often care for patients with advanced respiratory disease, who have less access to palliative care than patients with similar disease burden. The aims of this study were to: (i) explore the current and desired roles of RHPs in terms of palliative care and (ii) examine barriers to discussions with patients about palliative care.

Methods: An online survey developed and pilot tested. The survey was distributed nationally using the database of the Lung Association's RESPREC respiratory educator training program. Descriptive statistics were performed.

Results: A total of 123 completed surveys were returned, with respiratory therapists comprising the largest group of respondents. The majority indicated that end-of-life care was less than optimal for patients with advanced respiratory illnesses and agreed that palliative care should be a role of RHPs. Patient- and family-related barriers to having end-of-life discussions included: difficulty accepting prognosis, limitations and complications, and lack of capacity. For providers, the most important barriers were: lack of training, uncertainty about prognosis, and lack of time. The health care system barriers of concern were increasing demand for palliative care services and limited accessibility of palliative care for those with advanced respiratory diseases and difficulties in accurate prognostication for these conditions.

Conclusions: As RHP roles continue to evolve, consideration should be given to the ways in which RHPs can contribute to improving the quality of care for patients with advanced respiratory disease. Building collaborations with RHPs, palliative care, and other existing health programs can ensure high quality of care. Creating and taking advantage of learning opportunities to build skills and comfort in using a palliative approach will benefit respiratory patients.

05

CUFF LEAK TEST AND AIRWAY OBSTRUCTION IN MECHANICALLY VENTILATED ICU PATIENTS (COMIC): A PILOT RANDOMIZED CONTROLLED TRIAL

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Introduction: Laryngeal edema is a known complication of intubation that may cause airway obstruction in patients upon extubation. The only test available to predict this complication is the cuff leak test (CLT), however, its diagnostic accuracy and clinical utility remains uncertain. We conducted the Cuff Leak Test and Airway Obstruction in Mechanically Ventilated ICU Patients (COMIC) pilot study to determine the feasibility of undertaking a larger trial.

Methods: COMIC is an international multicentred, parallel-group randomised clinical trial (RCT). Mechanically ventilated adults from three centers admitted to the ICU who were deemed ready for extubation were enrolled. All patients had a CLT done prior to extubation. The intervention arm communicated CLT results to the team, who decided whether-or-not to proceed with extubation. The CLT results for the control arm were not communicated to the team and patients were extubated, regardless of the CLT. Primary outcomes focused on feasibility, including consent rate, recruitment rate and protocol adherence.

Results: 100 patients were enrolled. All feasibility criteria were met including: (i) recruitment rate of 7.6 patients/month, (ii) consent rate of 88.3%, and (iii) protocol adherence of 98%. There were two episodes of clinically significant stridor in the intervention group, and four patients required reintubation per group.

Conclusion: Although the CLT is a non-invasive test used to predict laryngeal edema and post-extubation stridor there are no RCTs to determine the impact of CLT on patient-important outcomes. The COMIC pilot found that it is feasible to conduct a powered RCT on the use of CLT in the ICU. Although underpowered to determine the effect of the CLT on clinical outcomes, there were no alarming differences in reintubations, or emergency surgical airways between the two pilot groups. A large RCT will help us to understand the risk and benefit of the CLT in critical illness.

06

THE USE OF IN SITU SIMULATION TO IMPROVE EMERGENCY DEPARTMENT STAFF COMFORT WITH THE MANAGEMENT OF HIGH ACUITY LOW OCCURRENCE CASES

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Introduction: In the emergency department (ED), high-acuity presentations encountered at low frequencies are associated with reduced staff comfort. Previous studies have shown that simulation can improve provider confidence with practical skills and management of presentations in various fields of medicine. The present study examined the effect of in situ simulation on interprofessional provider comfort with the identification and management of high-acuity low-frequency events in the ED. It further assessed the feasibility of implementing weekly simulation as an interprofessional education initiative in a high-volume ED.

Methods: This was a retrospective pre-test post-test quasi-experimental design. Weekly in situ simulation events were facilitated by an

interdisciplinary team in a high-volume ED that sees an average of 185 patients per day. To date, 34 simulation events were held between January 18, 2019 and November 22, 2019, and included neonatal, pediatric and obstetric emergencies, and adult codes. Events included a debrief, and typically lasted 60 min. There was an average of 20 patients presenting to the ED during these events. Participants included individuals from various disciplines working on shift at the time. Questionnaires were administered via email following the event, in which participants were asked to rank their comfort with emergency codes before and after the simulation using two 5-point Likert scales. The data from 39 questionnaires was analyzed. T-tests were used to analyze differences in self-reported comfort scores.

Results: Questionnaire responders included nurses (41%), respiratory therapists (26%), resident physicians (10%), paramedics (3%), attending physicians (3%), students of various disciplines (10%) and other (7%). 38% of participants reported increases in comfort following simulation when compared to prior. Using the 5-point scale, the average reported score for comfort pre-simulation was 3.59 (95% CI 3.30-3.88), and the average post-simulation score was 3.97 (95% CI 3.76-4.19, $P = 0.03$).

Conclusion: Our results demonstrate that weekly interprofessional in situ simulation is feasible in a high-volume ED, and significantly improves self-reported provider comfort with the identification and management of high-acuity, low-frequency events. This warrants the implementation of this simulation design to improve staff confidence and has implications for its potential role in improving team dynamics and patient safety.

07

OVERREPRESENTATION OF BLASTOMYCOSIS AMONG CANADIAN INDIGENOUS POPULATIONS

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Blastomycosis is a fungal respiratory disease endemic to the Ohio and Mississippi River basins and the regions surrounding the Canadian and American Great Lakes. The infection becomes symptomatic in approximately 50% of cases with severe cases resulting in acute pneumonias and acute respiratory distress syndrome (ARDS). Examination of affected patient populations in four studies within the target catchment areas revealed a proportional overrepresentation of Indigenous populations among those affected. Investigators retrospectively reviewed medical case records in patients diagnosed with blastomycosis within predetermined time frames from hospitals in the specified regions. This information was then used to evaluate patient demographics, which revealed the uncharacteristically common occurrence of blastomycosis in Indigenous populations in Manitoba and Northwestern Ontario.

The results of these studies were further examined, revealing the degree to which infection rate is disproportionate among Indigenous populations and also highlighting the severity of disease presentation in these groups. Studies found Indigenous people were more likely to contract the disease, they were more likely to present with symptoms at younger ages and they were more likely to be hospitalized due to the severity of their symptoms.

This information is vital for health care professionals working in the aforementioned regions. They must be aware of the disproportionate infection rate among Indigenous peoples so patients can be tested and diagnosed earlier, in hopes of providing earlier and more complete care. Focus should also be placed on public health initiatives providing education to the affected populations in hopes of preventing further cases.

08

CLINICAL OUTCOMES OF RESPIRATORY THERAPIST VS PHYSICIAN DRIVEN EXTUBATION AMONG POST CORONARY ARTERY BYPASS GRAFT SURGERY PATIENTS

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Introduction: Coronary artery bypass surgery demonstrated improvement in overall health-related quality of life and survival. The use of therapist driven extubation protocol resulted in shorter extubation times, reduced cost, and length of stay when compared with physician directed weaning.

Objective: To determine if using respiratory therapist (RT) driven extubation results to a shorter mechanical ventilation time among post coronary artery bypass graft surgery patients compared to physician driven extubation.

Methods: This is a retrospective analytical study conducted in January 2010–December 2012. A total 281 patients were included, 133 patients were assigned under the physician driven and 148 patients were allotted to the RT driven. Outcomes measured include duration of mechanical ventilation, Coronary Care Unit (CCU) stay, hospital stay and hospital acquired pneumonia (HAP).

Measurements and main results: The duration of mechanical ventilation was $8.35 \text{ h} \pm 12.38 \text{ h}$ in physician driven and $4.75 \text{ h} \pm 2.11 \text{ h}$ in the RT driven. The physician driven group spent 2.78 ± 1.76 days in the CCU while the RT driven group spent 1.79 ± 1.012 days. The duration of hospital stay in the physician group was 11.36 ± 5.05 days compared with RT driven group with 9.55 ± 3.92 days. Forty-one patients (30.8%) developed HAP in the physician group and 29 patients (19.6%) in the RT driven group.

Conclusion: The use of RT driven extubation protocol is a safe and efficient method in liberating patient from mechanical ventilation and reducing the CCU and hospital days and the incidence of hospital acquired pneumonia.

09

SURVEY OF THE ANESTHESIA ASSISTANT PROFESSION IN CANADIAN TEACHING HOSPITALS: 2007 TO 2019

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Introduction/background: The anesthesia assistant (AA) profession varies widely across Canada, both in level of education and clinical responsibility. A 2007 survey [1] examined the role of AAs at academic hospitals across Canada, focusing on technical and clinical responsibilities.

Objectives: This study aims to identify the educational background and clinical roles of AAs in Canadian University Departments of Anesthesia (ACUDA) hospitals and determine how they have changed over the last 12 years.

Methods: With institutional ethics approval, a non-interventional survey of ACUDA hospitals was completed between October, 2019 and January, 2020. Hospital managers or clinical leaders were contacted to complete a standardized, telephone-based survey. Data regarding AA education, clinical tasks, and scope of practice were collected and compared to findings from 2007. Analysis was completed using descriptive

statistics. Study findings from 2007 were compared to 2019 using Chi-squared testing, with significance level set at $p < 0.05$.

Results: A total of 15/17 ACUDA hospitals were available for participation, with 100% having some level of anesthesia assistance. On average, there were 21 AAs per hospital. Only 8 hospitals (53%) had AAs with formal certification, and 10 hospitals (67%) employed AAs without. AAs spent 25% of their time working in areas outside of the ORs, and 7/15 sites (47%) had 24-h, on-site AA coverage. The most common technical responsibilities of AAs included bronchoscopy assisting/cleaning, epidural/spinal anesthesia assist, line set up, and machine checks/set up (14/15 respectively). The most common clinical duties included monitoring general anesthesia/OR room relief (15/15; 14/15), intravenous insertion (15/15), and delivery of vasoactive, maintenance and induction medications (15/15). There were 8/17 clinical tasks with significant increases in frequency from 2007 to 2019.

Conclusion: Variability in educational background of AAs remains. Compared to 2007, AAs are present more outside of ORs. The AA role has demonstrated a shift towards more clinically based skills and responsibilities.

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10

THE RESPIRATORY THERAPIST PERSPECTIVE: A SURVEY OF CANADIAN RRTS WORKING IN THE COVID-19 PANDEMIC

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Introduction/background: COVID-19 presents predominantly as respiratory and cardiopulmonary symptoms [1], with respiratory therapists (RRTs) involved in the care of nearly all hospitalized COVID-19 patients. The experiences and challenges specific to the RRT profession during the pandemic have not been studied.

Methods: With institutional ethics approval, a cross-sectional survey was created through the survey software Redcap, and made available online from May 29 to July 6, 2020. Any RRT working in Canada during the COVID-19 pandemic or preparation period was eligible to participate. The survey was distributed by various professional societies, provincial regulatory bodies, and through social media. Survey data were analyzed using descriptive statistics.

Results: In total, 345 RRTs working in 11/13 of the provinces and territories, with varying years of experience completed the survey. In 30.7% ($n = 106$) of responses, RRTs were reassigned to accommodate the pandemic, and 36.2% ($n = 125$) worked more or different hours than before COVID-19. In 57.4% ($n = 198$) of responses, RRTs had cared for a COVID-19 positive (Co+) patient, and 50.7% ($n = 175$) cared for an intubated Co+ patient. In total, 89.6% ($n = 309$) of RRTs felt overwhelmed by new and frequently changing guidelines, with 66.7% ($n = 230$) of RRTs also experiencing communication issues around new guidelines. In 40.9% ($n = 141$) of responses, RRTs felt at risk of exposure due to lack of resources, and 89% ($n = 307$) of RRTs felt concerned for themselves or their family members becoming infected as a result of their proximity to Co+ patients. In 19% ($n = 67$) of responses, RRTs' departments had run out of PPE, and 12% did not feel adequately trained in PPE use. Of respondents, 19.7% ($n = 68$) had to be tested for COVID-19 and 1.7% ($n = 6$) had contracted the disease.

Conclusion: The COVID-19 pandemic adds another layer of stress for RRT professionals, who are working in high-risk situations, and feel anxious, overwhelmed and concerned about their personal safety.

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STUDENT POSTERS

WINNER

11

EFFECT OF MOTIVATIONAL INTERVIEWING-BASED HEALTH COACHING ON QUALITY OF LIFE IN SUBJECTS WITH COPD

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Introduction/objective: Chronic Obstructive Pulmonary Disease (COPD) is a respiratory illness that requires long-term symptom management. Pulmonary rehabilitation (PR) is often used by patients with chronic disease, like COPD, to improve their quality of life (QOL) through education and lifestyle changes. However, various factors (time, distance, etc.) may hinder a patient's ability to receive PR for management or to receive proper education. Thus, the objective of this study was to determine whether telephone health-coaching intervention using motivational interviewing had an effect on the incidence of readmission of hospitalized and stable COPD patients. This intervention would increase accessibility of PR services as patients can access these resources remotely.

Methodology: Fifty subjects with moderate to severe COPD received 10 health-coaching phone calls over 3 months to measure various factors affecting daily life. The first factor evaluated was improvement in dyspnea, measured using the Medical Research Council dyspnea scale. As well, disease-specific QOL measurements encompassing 4 domains (dyspnea, fatigue, emotional function, mastery) were gathered from the subjects through a Chronic Respiratory Disease Questionnaire. Lastly, a general QOL measurement was obtained through a self-rated health question.

Results: The study found significant improvements in reports of dyspnea, fatigue, emotional function, mastery, and QOL ($P = 0.002$, $P = 0.001$, $P = 0.001$, $P = 0.007$, $P = 0.03$, respectively). Thirty-six (71%) of the subjects had clinically important improvements in one or more of the measures, and thirty (58%) had less significant, but still clinically important improvements for at least one domain measured by the Chronic Respiratory Disease Questionnaire.

Conclusion: Ultimately, the study demonstrates the effectiveness of telephone interventions that use motivational interviewing. Subjects responded well and the method of PR was simple and feasible. These findings suggest that telephone health-counselling may be a promising alternative for those unable to access PR programs.

12

THE EFFECT OF CLIMATE CHANGE ON RESPIRATORY DISEASE

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Climate change and the associated decrease in air quality has led to profound effects on the widespread presence of respiratory diseases and

allergens. Urbanized lifestyles and growing transportation emissions have shown to have a negative impact on the environment.

Predominantly, increased average temperatures, CO₂ and NO emissions, allergens and mold production, harsh weather conditions and Volatile Organic Compound (VOC) release from vegetation.

Based on a review of past literature; the present study provides an overview of the link between the prevalence of respiratory disease and allergies in response to anthropogenic factors that have induced global climate change.

There are an abundance of factors that are contributing to climate change that can be correlated to respiratory diseases and allergies. Respiratory disorders that correspond to climate change include: allergic respiratory disorders, asthma, exacerbations of chronic obstructive lung disease, and decreases in lung function. Increase in vehicle emissions over the years has been shown to have a direct relationship with respiratory allergies. Increase in respiratory allergies has also been linked to people who live in industrialized areas.

These results indicate that climate change is affecting the respiratory health of a wide variety of people. There are many disorders, including an increase in allergies and different diseases, that correspond to climate change and that factors causing climate change. This information is important and very relevant due to the drastic changes that have happened to our Earth in the past 10 years. In the past 10 years CO₂ emissions have increased 10%, sea levels have risen 1.6 inches, and average temperature has increased by 0.22° C.

13

MANAGEMENT OF ACUTE CARBON MONOXIDE POISONING WITH POSITIVE AIRWAY PRESSURE AS A VIABLE ALTERNATIVE TO CONVENTIONAL OXYGEN THERAPY AND HYPERBARIC THERAPY IN RURAL EMERGENCY DEPARTMENTS

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Carbon monoxide (CO) poisoning was responsible for 3027 hospital admissions between 2002 and 2016, along with 4990 accidental deaths between 2000 and 2013. More frighteningly, there has been no decline in hospitalizations in the past 18 years despite the widespread implementation of CO detectors. The consequences of elevated carboxyhemoglobin (COHb) ranges from headache at 20% to becoming fatal at 80% COHb. The objective of this research is to convey that continuous positive airway pressure (CPAP) therapy should be the primary intervention used for CO poisoning in rural emergency departments. In a case-study conducted by Idil et al., 2 patients exposed to CO in their home had COHb measuring 24% and 26%. COHb dropped to 3% within 5 h for the patient with the non-rebreather mask (NRBM) and within 2 h for the patient with CPAP. A study by Roth et al. revealed that COHb levels took nearly 3 times longer to reach the same reduced concentration for the patient treated using a NRBM over CPAP. Traditionally, CPAP is indicated for refractory hypoxemia and effectively decreases the sensation of dyspnea, which are the most prevalently reported symptoms in CO poisoning. Initial research has been promising in favour of using CPAP with 100% oxygen to reduce the half-life of COHb more rapidly than conventional NRBM. HBOT has commonly been utilized but is not feasible in rural communities as therapy would not be received within a desirable period of time and transportation itself poses additional risks. The implication of CPAP for CO poisoning is immense considering its ability to reverse the causative mechanism, treat signs, and relieve symptoms. The implementation of CPAP for treatment of CO poisoning in adults is an emerging and promising advancement in health care that Respiratory Therapists should be aware of and advocate for continued research in.

14

OUTCOMES OF INTERPROFESSIONAL EDUCATION (IPE) IN SIMULATION FOR HEALTH CARE STUDENTS

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Interprofessional education (IPE) is defined as students from two or more professions collaborating to learn from each other [1, p. 600]. IPE is an evidence-based approach that encourages students to work with a team of people outside their immediate scope of practice [2, p. 269]. The objective of this literary review is to weigh the benefits and consequences of interprofessional simulation as a method of training for student respiratory therapists (SRTs).

This literature review includes quantitative and qualitative research conducted from 2013–2020. Search words used on various databases include: “simulation,” “interprofessional” and “respiratory therapy students.” Studies are from peer-reviewed journals and were collected based on their relevance to interprofessional education in respiratory therapy.

Various research outlines the effect that interprofessional collaboration in a simulated setting has on health care students. IPE allows students to understand how different practitioners utilize their expertise to provide effective patient-centred care. Zamjahn et al., [3] stated that other health care students became aware of the knowledge and skill set of RTs post-IPE. IPE is especially beneficial for high-risk and infrequent emergency airways as practiced responses play a role in reducing adverse patient outcomes (p. 510). Coyle [4] states the importance of being prepared when infrequent situations arise by practising efficient interprofessional team communication (p. 40). Siaglet [5] suggests simulation learning is optimized when supplemented with an information session on team training concepts (p. 65). Palominos et al. [6], found that simulation based learning also protected patients from unnecessary risk as SRTs were able to make mistakes while learning (p. 36). Some research discusses the negative consequences of IPE simulation. Lee et al. [7], reported that students felt uncomfortable being closely observed during simulations and that working with other professions led to confusion when dividing roles (p. 18). However, post-simulation debriefing and being able to repeat a simulation procedure lead to a more positive simulation experience for the learner.

Based on numerous studies, IPE has beneficial effects for health care students. Within the realm of respiratory care specifically, interprofessional teams consisting of physicians, nurses, physiotherapists and respiratory therapists frequently work together to provide care. Therefore, it would be beneficial for students to be exposed to working in an interprofessional team throughout their educational career. This gives them the opportunity to receive constructive advice from other professions and also allows them to learn from their mistakes in a safe environment.

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PULMOVISTA 500 BY DRAGER: A SNAPSHOT OF CLINICAL USABILITY IN THE ICU SETTING

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The PulmoVista 500 (PV 500) uses electrical impedance tomography to create numerical and graphical representations of regional ventilation. Through non-invasive real-time monitoring, clinicians such as physicians and respiratory therapists can monitor changes in lung ventilation due to mechanical ventilation, PEEP, recruitment maneuvers or intubation. A current challenge is mechanically ventilating patients with complex lung dysfunction such as ARDS, COPD and Cystic Fibrosis while minimizing ventilator induced lung injury and over-distension. Research suggests that mechanically ventilated patients with ARDS, an inhomogenous lung condition, can benefit from electrical impedance tomography monitoring. In these patients, the PV 500, through individualized PEEP titration, can help prevent over-distension and VILI by optimizing ventilator settings. A survey was conducted in a multiple choice and rating scale format by respiratory therapists and physicians at a Toronto academic research hospital to assess the usability of the PV 500 in the ICU setting. This was done to assess if using the PV 500 on mechanically ventilated patients result in changes to clinical therapies including ventilation settings such as PEEP, Peak Inspiratory Pressures or changes in drug therapy. Results obtained from the survey, completed by 4 physicians and 3 respiratory therapists (n = 7) indicate that all participants selected “to conduct a PEEP trial and determine optimal PEEP” as an indication. All participants selected “Yes” to adjusting clinical therapy based on results obtained from the PV 500, primarily the level of PEEP, Vt or Driving Pressures. This suggests using the PV 500 leads to changes in clinical therapies, the primary outcome being optimization of PEEP. Small sample size (n = <10) and limited responses make extrapolation to a larger population of clinician users difficult. In the future, RCTs with a larger sample size of clinicians is needed to better understand the usability of this device in the ICU setting.

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GROWTH AND NEURODEVELOPMENT OUTCOMES OF CAFFEINE THERAPY IN NEONATES

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Introduction/objective: Caffeine therapy is one of most commonly administered treatments in neonatal medicine for the management of apnea of prematurity (AOP). Regardless of this, the long-term effects of its use are not well researched for other organs systems, therefore its safety and efficacy are unknown. The objective of this literature review is to evaluate the role of early caffeine therapy on neurodevelopment and growth of newborns.

Methodology: A systemic investigation of the current literature was completed with access to research pertaining to the varying outcomes of caffeine therapy in the neonatal population.

Results: Multiple studies show the use of early caffeine therapy in neonates led to a decrease in Neurologic injuries/impairment. Injuries such as cerebral palsy and language/visual impairment, were assessed based on the Bayley's Scale III. A score of <70 is known to be severe impairment, however, after the caffeine therapy the score was improved to a

score of <85 (mild impairment). Studies also found a significant reduction in the incidence of developmental coordination disorder.

Conclusion: Studies have shown low birth weight infants benefit from caffeine therapy without neurodevelopmental impairments. Caffeine therapy remains a sensible option for use in preterm newborns. However, future investigations should include an improved method of quantifying neural outcomes and more long-term cohort studies to determine how the child's quality of life is impacted.

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PREVALENCE OF OBSTRUCTIVE SLEEP APNEA SYMPTOMS AND EXCESSIVE DAYTIME SLEEPINESS AMONG COMMERCIAL BUS DRIVERS IN FIRST DISTRICT OF LAGUNA

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Research supports that obstructive sleep apnea (OSA) is a significant cause of road traffic accidents resulting in two to sevenfold increased risk. This lack of screening for OSA and excessive daytime sleepiness (EDS) as part of the licensing requirements for commercial bus drivers in the Philippines prompted the researchers to determine the prevalence of OSA and EDS among this specific population. Cross-sectional study of 30 commercial bus drivers was performed. The driver's demographic and clinical profile, sleeping habits, occupational characteristics and data needed for STOP BANG, Berlin and Adjusted Neck Circumference (ANC) Scoring questionnaires to evaluate the driver's risk of having OSA and data for Epworth Sleepiness Scale to assess the driver's probability of EDS were gathered and analyzed. Statistical analyses were made through the latest version of Minitab® Statistical Software. The profile of Filipino bus drivers was that of middle-aged male (mean age of 43.3 years), who was able to reach secondary level of education (63.3%), with propensity to be overweight (BMI = 24.96 kg/m²). Respondents were likely non-smokers (73.3%), moderate to heavy alcohol drinkers (83.3%), and moderate to heavy caffeine drinkers (93.3%). The most common co-morbidity seen in the sampled population was hypertension. A small number of respondents admitted to a history of illicit drug use (13.3%). Respondents compensated their multiple awakening during sleep (80%) with frequent daily naps. Respondents have been engaged in this occupation for 12.6 years, have driven almost daily, with each trip lasting 13.3 h and covering 303.80 ± 55.12 kilometers daily. Most of the respondents have been involved in traffic accidents (43%), almost one-third of which is sleeping-related (13.3%). The prevalence of OSA symptoms

(55.75%) and EDS (53%) were higher than the general population. Increasing the number of days of the driver on the roads increased his propensity to encounter sleep-related accidents.

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CHARGED UP: IMPLEMENTATION OF THE ELECTRICAL DIAPHRAGMATIC ACTIVITY CATHETER IN PATIENTS WITH AN ACUTE SPINAL CORD INJURY

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Efficient and timely liberation from mechanical ventilation of acute spinal cord injury (ASCI) patients can help prevent the progression of rapid diaphragmatic disuse atrophy. ASCI patients are too often placed on conventional modes of ventilation, which limits their use of diaphragm function and as a result leads to prolonged Intensive Care Unit (ICU) stays. Clinicians are increasingly shifting their focus on a more systematic approach, to reduce length of ICU stay and dependence on mechanical ventilation in these patient demographics. One such approach is the early utilization of the Electrical Activity of the Diaphragm (Edi) catheter coupled with Neurally Adjusted Ventilatory Assist (NAVA) mode. The Edi-NAVA concept was implemented to allow early detection of diaphragm activity and prevent disuse atrophy. The objective of this poster will be to provide supportive evidence for the use of the Edi catheter in ASCI patients, particularly analyzing the methodical approach in order to prevent diaphragm dysfunction in ASCI patients. A literature review was conducted to examine the use of the Edi catheter and NAVA in reducing prevalence of disuse atrophy of the diaphragm and reviewing the current literature's ventilator weaning strategies for the ASCI patient. Most authors stressed the importance of psychological support and careful assessment of respiratory muscle unloading, as a key determinant in liberation from mechanical ventilation in these patient demographics. Current literature utilizes partial support modes during the day and full supportive modes overnight. In contrast, measuring Edi has allowed for continuous monitoring of a patient's respiratory drive, objective and quantitative decision making for weaning and extubation, and quick real-time analysis to adjust supports levels. Therefore, utilizing the Edi catheter in the ASCI patient population has the potential to reduce: the occurrence of patient ventilator asynchronies, diaphragmatic dysfunction, and allow for earlier liberation off the ventilator.