



Proceedings from the Canadian Society of Respiratory Therapists Annual Conference May 13–14, 2022

We are pleased to present a select number of abstracts from the proceedings of the CSRT Annual Conference. Held virtually May 13–14, 2022, this conference included topics delivered by individuals with expertise in various areas of respiratory therapy practice.

As evidenced by the following abstracts, the work of our colleagues in 2022 highlighted current research and practice innovations led by RTs. We have made every effort to include all abstracts accepted by the Program Committee before the publication deadline; however, please note that this collection does not represent the entire program (available at www.csrt.com).

The editorial board looks forward to receiving manuscripts from this conference for consideration for publication in the *Canadian Journal of Respiratory Therapy* in order to continue building the body of knowledge specific to our profession.

Friday, May 13

01 LEARNINGS FROM THE LARGEST OUTBREAK: THE EMERGENCY RESPONSE MINDSET

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In the community of La Loche in Northern Saskatchewan, we experienced the highest COVID outbreak per capita. We were dealing with a complex problem where the answer is not clear, and we had to act as 7% of the population, tested positive for COVID-19. Due to the cases in La Loche and a transient population and little to no cell phone service, traditional test, trace isolate methods were not successful. We established a partnership with SHA, Metis Nation, Clear Water Dene Nation, and the Village of La Loche through engaging others. Together we performed 3 core activities:

- Door to Door testing: We tested every individual in the community, bringing 37 staff from around Saskatchewan to support us.
- Managed Alcohol Program: overnight establishment when alcohol sales ceased due to municipal bylaw
- Community awareness: Daily communication translated into dene on the radio.

The combined efforts and results led to us in a matter of 3 months to having 0 cases of COVID-19 in La Loche with a culture change away from health service delivery to community health improvement. In conclusion, no one organization can do it all; we need everyone advocating for health.

02 LONG TERM IMPACT OF COVID-19: A SYSTEMATIC REVIEW

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Background: The long-term impact of COVID-19 is still unknown. **Objective:** This study aimed to explore post COVID-19 effect on patients' chest computed tomography (CT), lung function, respiratory symptoms, fatigue, functional capacity, health-related quality of life (HRQoL) and the ability to return to work beyond 3 months post-infection.

Methods: A systematic search was performed on PubMed, Web of Science and Ovid MEDLINE on May 22, 2021, to identify studies that reported persistent effects of COVID-19 beyond 3 months follow-up. Data on the proportion of patients who had the outcome were collected and analyzed using a one-group meta-analysis.

Results: Data were extracted from 24 articles that presented information on a total of 5323 post COVID-19 adults between 3 and 6 months after symptoms onset or hospital discharge. The pooled prevalence of CT abnormalities was 59% (95% CI 44-73, I² = 96%), abnormal lung function 39% (95% CI 24-55, I² = 94%), fatigue 38% (95% CI 27-49, I² = 98%), dyspnea 32% (95% CI 24-40, I² = 98%), chest pain/tightness 16% (95% CI 12-21, I² = 94%), and cough 13%, (95% CI 9-17, I² = 94%). Decreased functional capacity and HRQoL were found in 36% (95% CI 22-49, I² = 97%) and 52% (95% CI 33-71, I² = 94%), respectively. On average, 8 out of 10 of the patients had returned to work or reported no work impairment.

Conclusion: Post-COVID-19 patients may experience persistent respiratory symptoms, fatigue, decreased functional capacity and decreased quality of life up to 6 months after infection. Further studies are needed to establish the extent to which post-COVID-19 effects

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continue beyond 6 months, how they interact with each other, and to clarify their causes and effective management.

03

MICROPREEMIES: THE NEW NICU REALITY

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Parents love their babies, and they want them to be periviable no matter how prematurely they enter the world. And because NICU clinicians are exceptionally good at what they do, the edge of viability has steadily lowered to the point that we are being asked to treat 22 and 23 weekers, babies that are sub-500 grams, babies with the smallest airways and least developed, most vulnerable alveolar/capillary interface we have ever treated. This presentation will describe critical stages of fetal lung growth and the importance of understanding these stages to develop appropriate treatment strategies for optimizing outcomes.

Evidence-based data from a large group of patients will be shared showing a 70% survival rate for 22 weekers and 82% for 23 weekers, both with an exceptionally low incidence of IVH and other untoward consequences of ventilation.

04

ENGAGING VACCINE HESITANT PATIENTS: AN ETHICS APPROACH

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Vaccine hesitancy has been presented as a great obstacle to the “end of COVID.” The large groups of protestors and low compliance have created tensions between groups of individuals. Healthcare providers have expressed anger and frustration to have unvaccinated individuals arrive at the emergency department in deteriorating conditions when these severe conditions could have been prevented.

However, patient-centered care advocates that the patient’s voice and values are acknowledged. Vaccine hesitancy, vaccine defiance, and mistrust of the medical profession have been continuous and recurrent phenomena. There are many instances in which medical research and technology occurred at the exploitation of marginalized groups. The Tuskegee Syphilis experiment is well known but others have been obscured. Indeed, ethicists acknowledge that moral objections to questionable research methods can be overturned in cases of emergency. Patients do have their own reasons why they may be vaccine hesitant despite acknowledging that vaccination is necessary.

This presentation will present an ethics methodology approach to encourage collaboration between opposing groups. Reasons for both vaccine hesitancy and vaccine support will be presented. The goal is to provide respiratory students and professionals with additional tools to approach vaccine-hesitant patients so that future confrontations are collaborative and proactive. Recommended methods on how to approach and challenging patients on their values can help guide difficult discussions around vaccinations and mistrust in healthcare.

05

THE SIGNIFICANCE OF VENTILATOR- ASSOCIATED PNEUMONIA IN SARS-COV-2

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Introduction: We performed a systematic review to compare the prevalence and mortality burden of ventilator-associated pneumonia (VAP) in SARS-CoV-2 patients.

Material and methods: We conduct this systematic review and meta-analysis according to Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) statement. We searched PubMed, Scopus, Web of Science, Embase, and Cochrane from the database’s inception to February 10, 2021.

Results: Five studies were identified. VAP occurred in 45.2% in the COVID-19 group compared to 26.0% for the non-COVID-19 group (OR = 3.17; 95% CI [1.94, 5.18]; $P < 0.001$; I² = 67%). Three studies showed VAP recurrence to be 41.6% in the COVID-19 group and 20.2% in the non-COVID-19 group (OR = 3.12; 95% CI [1.87, 5.22]; $P < 0.001$; I² = 0%). The mortality rate in COVID-19 vs. non-COVID-19 varies, amounting to 32.1% and 26.3%, respectively (OR = 1.33; 95% CI [1.07, 1.66]; $P = 0.010$; I² = 49%).

Conclusions: The findings from this case series reveal that the presence of ventilator-associated pneumonia in SARS-CoV-2 patients is a source of significant mortality. This study strengthens the importance of non-invasive mechanical ventilation strategies and also highlights the need for careful infection control surveillance in invasive mechanical ventilation. Due to the high rates of VAP and associated increased mortality, uprating antibiotic/antifungal therapy selection is also paramount in caring for SARS-CoV-2 cases admitted to the ICU.

06

UPTAKE OF COVID-19 VACCINATION AMONG RESPIRATORY THERAPISTS IN CANADA

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The COVID-19 pandemic continues throughout the world causing morbidity and mortality. With communities in and out of lockdown, there is an economic and mental health crisis on top of the general COVID-19 health crisis. The development of COVID-19 vaccines is often touted as the solution to this crisis but vaccine effectiveness is dependent on the uptake by the world’s population. Canada has currently approved five vaccines and began vaccination in mid December 2020. Healthcare workers were amongst the initial groups for vaccination; however, uptake rates were not initially as high as expected. The Respiratory Therapy profession was on the frontline in the fight against COVID-19, dealing with the most critically ill patients and seeing regularly the most deadly effects of this virus. The rate of vaccination for the Respiratory Therapists in Canada is evolving constantly but it is not clear where it stands in comparison to other Canadian health care workers. In addition, the drivers or factors that play into the decision to get vaccinated are also not clear.

Canadian Respiratory Therapist COVID-19 vaccination uptake rates and responses are being investigated with a look at the reasons behind any delays or non-vaccinations as well as other demographics, attitudes or factors that may be shown to play a role. An anonymous survey using SurveyMonkey® on vaccination uptake rates, responses and attitudes is available to Student, Graduate and Registered Respiratory Therapists in Canada from July to November 2021. Vaccination uptake rates will be compared to those of healthcare workers in general as per the Government of Canada stats looking at numerous factors including demographics; work and personal experiences with COVID-19 patients; and COVID-19 vaccination attitudes/concerns. The study will look for any trends in vaccination rates by demographic data, COVID-19 exposure, work experience as well as attitudes for those who are not vaccinated. This data can help by providing information on vaccination uptake rates amongst Respiratory Therapists compared to the healthcare workers and the general populations’ rates in Canada. Future studies may look closer at developing specific vaccination campaigns by targeting the reasons for non-vaccination amongst RTs in Canada. Study data will be presented and to date there are over 1000 surveys completed.

07 USING AND CHOOSING THE RIGHT INHALED DRUG DELIVERY DEVICE

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The MDI was a major breakthrough in the 1950s and set the stage for other technology to come. Nineteen seventy saw the development of breath-actuated dry-powder inhalers. Since that time, more than 30 new inhalers have come to market from MDIs, SMIs, and DPIs. Using and choosing the right delivery device can have a direct impact on your patient care. To find the best inhaler for your patient, you need to find a balance between the correct medication and the type of inhaler that fits the needs and abilities of your patients. This presentation will focus on how to use and choose the appropriate inhaler for your patients.

Saturday, May 14

08 RESPIRATORY THERAPISTS' MENTAL HEALTH AND EXPERIENCES DURING COVID-19

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Respiratory therapists (RTs) are enduring novel COVID-19-related challenges, compacting upon existing stressors in the profession, including a lack of adequate personal protective equipment and increased exposure to death and dying. Here, RTs are at an increased risk for a host of negative psychological impacts, such as anxiety, depression, PTSD or moral injury. Critically, little is known about the mental health and experiences of RTs during the COVID-19 pandemic. With the mental health of this vital workforce at stake, it is essential to understand the impact that serving on the frontlines of the COVID-19 pandemic has had on Canadian RTs.

RTs from across Canada were invited to complete an online survey and virtual interview about their experiences during the second wave of the COVID-19 pandemic. The survey included basic demographic information (e.g., sex, age, marital status) and questionnaires about mental health and functioning. The virtual interview allowed RTs to share and discuss challenges and associated impacts experienced during the pandemic as well as their opinions on relevant supports.

Two-hundred and forty-two ($N = 242$) RTs from across Canada participated in this study. While data analysis remains ongoing, preliminary analyses reveal that RTs are suffering from the provision of perceived futile care and standing in for family at the bedside of dying COVID-19 patients. Symptoms of anxiety, depression, PTSD, moral distress and moral injury are relevant concerns among RTs. COVID-19 restrictions have prevented RTs from engaging in usual coping strategies (e.g., going to the gym, going out with friends and family). Furthermore, a quarter of our sample reported that they were considering leaving their position due to moral distress, with these individuals endorsing greater symptoms of all negative psychological outcomes included in this study than their counterparts who did not report considering leaving their position.

Providing care during the second wave of the COVID-19 pandemic has negatively impacted Canadian RTs' mental health. Adequate resources and interventions are essential to support RTs during and beyond the pandemic and to ensure the continuity of our healthcare system.

09 MODERN VV-ECMO FOR RESPIRATORY THERAPISTS

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Venovenous extracorporeal membrane oxygenation (VV-ECMO) is recommended for the treatment of acute respiratory distress syndrome (ARDS) with refractory hypoxemia or when lung protective ventilation cannot be applied. Coronavirus disease (COVID-19) pandemic led to the increase in the cases of ARDS requiring VV-ECMO. As a result, critical care respiratory therapists (RTs) are more frequently involved in the care of VV-ECMO patients. In this role, the RTs are not only required to have basic knowledge of ECMO technology, but they also must understand the complex interaction between a patient, a ventilator, and an ECMO machine.

The objective of the presentation will be to provide RTs with the essential practical knowledge of modern VV-ECMO therapy required for the treatment of ARDS patients.

The presentation will include perfusionist's and RT's perspectives from one of the largest academic health networks in North America. It will be demonstrated that the collaboration between two clinical fields of perfusion and respiratory therapy is required for the optimal care to the ARDS patients. The presentation will cover the main steps of therapeutic algorithm for VV-ECMO ARDS patients: 1. an optimization of mechanical ventilation before VV-ECMO consideration; 2. VV-ECMO indications; 3. start, maintenance and weaning phases of VV-ECMO; 4. post decannulation. The complex interaction between a patient, a VV-ECMO machine, and a mechanical ventilator as well as challenges of respiratory monitoring will be discussed.

The obtained knowledge will allow RTs to provide optimal respiratory care at each stage of VV-ECMO process.

10 THERAPEUTIC HYPOTHERMIA AS A RESCUE THERAPY FOR SEVERE ARDS

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Background: Severe acute respiratory distress syndrome (ARDS) occurs in nearly 25% of all mechanically ventilated patients in the ICU. With the evolving coronavirus pandemic, ARDS has become even more common. Severe ARDS has a mortality rate estimated at 35%–45%, despite rescue therapies such as proning and ECMO. This indicates there is a need for alternative therapies. Therapeutic hypothermia is a non-invasive therapy that has successfully been used in patients with severe ARDS. Therapeutic hypothermia involves cooling the body to target temperatures of less than 36 °C. This has been shown to reduce mortality and improve neurologic outcomes for a select group of patients. Mild therapeutic hypothermia is currently being used to prevent anoxic brain injury post-cardiac arrest in adults and is now being trialed for severe ARDS.

Objectives: To discuss the use of therapeutic hypothermia as rescue therapy for patients with severe ARDS. This presentation will also discuss the current barriers to targeted temperature management.

Discussion: In some cases, once patients have been proned and fail to improve, extracorporeal membrane oxygenation (ECMO) is considered. ECMO is extremely invasive and has had poor outcomes when used in the adult population. Therapeutic hypothermia is much less invasive than ECMO, especially when using the surface cooling method. Therapeutic hypothermia use has been limited due to a lack of protocols for treatment time as well as how to rewarm patients. In a small-sized study, the group of ARDS patients treated with therapeutic hypothermia was shown to have a significant reduction in mortality compared to the control group.

Conclusion: For therapeutic hypothermia to be used more frequently, there needs to be further research into the amount of time a patient needs to be cooled for, as well as the speed of rewarming. If these protocols can be developed, therapeutic hypothermia could be a promising rescue therapy for ARDS.

11 THE AA'S ROLE IN THE OUT-OF-HOSPITAL SETTING PAIN MANAGEMENT

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Anesthesia assistants work closely with anesthesiologists' as "physician extenders" to support the increasingly complex medical and surgical care of patients. Advancements in anesthesia and the need for anesthesia care outside of the hospital have increased and require anesthesia services to be provided in clinics and remote offsite locations. With this extension of care outside of the hospital comes some challenges. These can include a range of factors including those relating to the care environment and available resources, diversity of medical professions supporting the anesthesia care, patient comorbidities, the nature of the procedure being performed, the depth of sedation, and adherence to the various relevant guidelines and protocols.

This presentation will focus on the differences and challenges that one might encounter in the out-of-hospital role as the anesthesia assistant and proposes some solutions.

12 END OF LIFE CARE EDUCATION FOR RESPIRATORY THERAPISTS

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Purpose: The purpose of this study is to determine respiratory therapists' (RTs) comfort level with end-of-life care (EOLC) and moral distress experienced while practicing. Additionally, the study will determine if improvements with EOLC education within respiratory therapy programs in Western Canada are necessary.

Design: A needs assessment survey for practicing RTs in western Canada was developed based on a literature review conducted on EOLC education and moral distress. The survey was distributed to practicing RTs in Canada with a focus on RTs in British Columbia (BC) and Alberta. Multiple methods were used in the development of the survey questions and analysis.

Results: There were 108 respondents. When asked to rate their current comfort level with working with patients receiving EOLC on a scale between 1 and 10 (1 = very uncomfortable and 10 = very comfortable), the mean was 5.13 with a standard deviation of 2.6. Respondents were then asked to rate their satisfaction with their in-classroom learning (before graduation) in preparing them for working with patients receiving EOLC. Of the respondents, 69% were very dissatisfied or dissatisfied, 26% were neutral and 5% were satisfied or very satisfied. Years experience was cross-compared to moral distress and moral distress encountered when working with patients receiving EOLC. The results showed that regardless of the year's experience, moral distress was felt by some RTs within that experience category when working with EOLC patients.

Summary: There is evidence that an education program developed specifically for RTs regarding EOLC can improve comfort with EOLC. The survey results display that moral distress is associated with EOLC and is experienced by practicing RTs. The results also indicated that the majority of respondents expressed that their education on EOLC and moral distress pre-clinically did not adequately prepare them for working in EOLC after graduation. If we can improve comfort levels with EOLC

through an education program for both the RT student and experienced RT we may be able to reduce moral distress overall when working with EOLC patients. This could lead to an improvement in burnout, turnover, and enhanced resilience among this group of healthcare professionals.

13 AEROSOL PRECAUTIONS IN PULMONARY FUNCTION TESTING

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Pulmonary function tests (PFTs) are important for the diagnosis, management, and monitoring of lung disease. Throughout the pandemic there have been considerable disruptions to PFT laboratories and conflicting recommendations between jurisdictions and health care centres regarding aerosol precautions and personal protective equipment. The CTS and CSRT working group on PFT resumption continues to review available evidence and provide ongoing recommendations for the resumption of services during the post-peak phase of the pandemic. We've also worked with stakeholders from around the country to understand the conflicting viewpoints and advocate for aerosol precautions in the PFT laboratory. In this talk I will highlight the considerations of the working group, summarize the rationale for the recommendations and discuss ongoing advocacy efforts to raise awareness of the need to implement multiple layers of precautions to protect patients and staff from COVID-19 and other respiratory viruses.

14 MANAGING THE RISK OF SPINAL CORD ISCHEMIA DURING VASCULAR SURGERY

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Spinal cord ischemia causing paraplegia is the most relevant, life threatening and life altering complication of thoracic aortic surgery caused by compromising the segmental arteries. Thoracoabdominal aortic surgery is associated with high morbidity and mortality. The role of the Anesthesia Assistant in complex vascular cases can make a significant contribution in aiding the anesthesiologist in providing anesthesia care throughout the pre-op, intra-op and post-op phases of care. It is imperative that the CCAA has a strong understanding of spine anatomy and physiology and associated blood circulation, diseases of the thoracic aorta, enhanced anesthesia monitoring techniques used during vascular surgery, applied technologies such as blood cell salvage devices and cerebral spinal drains, and vascular anesthesia considerations, goals and objectives to be maximally effective in helping the surgical team successfully navigate the patient through the peri-operative period. The aims of this presentation are to: review spinal cord perfusion and related anatomy and physiology; identify at risk populations and how ischemic injury can occur; distinguish the differences between aneurysm vs dissection and classification of vascular disease; discuss anesthesia considerations for aneurysm repair of the aortic root, thoracic aorta and thoracoabdominal aorta; and discuss intraoperative goals of care and interventions in managing the risk of spinal cord ischemia during thoracic vascular surgery.

15 ONE SCHOOL'S EXPERIENCE WITH TRANSGENDER SIMULATION

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The latest report by Statistics Canada indicates that there are approximately 1 million Canadians who identify as members of the LGBTQ2S+

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community. Currently, the transgender population in Canada is sitting at 0.35% or 131,000 people. Even though this number may seem low, this population of our citizens are often exposed to social issues which may prohibit them from seeking healthcare in a timely manner, if at all. It is the responsibility of all professions to ensure patients feel safe in the world of medicine and will seek care as needed. Fostering a feeling of safety in this population is not the only challenge for Respiratory Therapists and the healthcare team. Potential medical errors can occur when clinicians do not have appropriate awareness when treating these patients.

There is a distinct lack of integration of these issues within Respiratory Therapy programs. While there have been studies done in nursing, dietary sciences, pharmacy, social work and medicine to date, these studies are proving that the healthcare teams are still deficient in this realm of practice. Provincial regulatory bodies and the National Competency Framework do not provide clear direction or specific

expectations in this area. Some educational institutions and healthcare bodies are incorporating learning modules for staff to help provide information on this topic, but this is still not widespread, nor does it reach the myriad of learners within those systems.

The Southern Alberta Institute of Technology Respiratory Therapy program has taken on the task of incorporating education and creating awareness about this population and the challenges they face, into their curriculum. Their first foray into this area was with a Pulmonary Function simulation in Year 3 of the 3-year program. This was an interesting experience for both students and educators with some unforeseen challenges that were encountered. Despite the challenges, there was great learning gleaned from this experience which has stimulated the program to delve deeper into this area. SAIT would appreciate the ability to share our experiences with the hopes that more awareness will be created. An inclusive environment is a safe one.