

General

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Abstract

We are pleased to present a select number of abstracts from the proceedings of the CSRT Annual Conference. Held in Ottawa, Ontario, from May 8 to 10, 2025, 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 2025 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.

Please note these abstracts have not been peer-reviewed.



CANADIAN SOCIETY OF RESPIRATORY THERAPISTS

SOCIÉTÉ CANADIENNE DES THÉRAPEUTES RESPIRATOIRES

THURSDAY, MAY 8, 2025

POTHoles AND PYLONS: CHALLENGING TRANSITIONS - A MANITOBA EXPERIENCE

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Transitioning medically complex paediatric patients to home or adult care, especially in remote regions like Northern Manitoba, presents significant challenges. In Manitoba, where most of the health services are concentrated in the southern part of the province, discharge and transition planning for children, particularly those with trachs and ventilation needs, becomes even more complicated. This

presentation will share two case studies: one involving toddler twins who are both trach and ventilated, and another focused on transitioning a paediatric patient on non-invasive ventilation to adult care. Both cases highlight the difficulties of coordinating care in underserved areas and will offer a platform to discuss potential strategies to improve these transitions.

FANTASTIC VOYAGE: EXPLORING THE BODY TO IMPROVE NEONATAL OUTCOMES

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Understanding the body through medical innovation and exploration enables clinicians to improve diagnostic accuracy, implement timely interventions, and optimize patient

outcomes. This presentation focuses on the role of clinical evaluation and technological tools for assessing the body, newer techniques for optimizing IVF, and the goals of the HearHer campaign for evaluating fetal distress, all of which are aimed at reducing pregnancy-related complications and fetal and maternal injury and mortality. The role of epigenetics in child development will also be discussed. Traditional tools and techniques for embryo implantation and evaluating expectant mothers and fetuses have evolved. Implementation of the HearHer campaign has shown increased reporting and recognition of symptoms leading to timely medical interventions and improved maternal outcomes during pregnancy. Better methods of mechanical ventilation and preventative diagnostics have improved outcomes for premature infants. The integration of technological advancements with clinical expertise enhances the ability to identify and manage complications before, during, and after pregnancy and childbirth to optimize outcomes.

ARTIFICIAL INTELLIGENCE IN RESPIRATORY THERAPY: FROM CURRICULUM INTEGRATION TO PRACTICAL IMPLEMENTATION

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The rapid advancements in artificial intelligence (AI) are reshaping healthcare, and respiratory therapy is no exception. AI technologies hold significant potential to enhance clinical outcomes, optimize patient care, and improve decision-making processes in respiratory care. However, a critical gap exists between the integration of AI in educational curricula and its practical application in clinical settings. This presentation aims to explore the seamless integration of AI in respiratory therapy education and its subsequent translation into everyday clinical practice, outlining both opportunities and challenges. The first focus of the presentation will be the integration of AI into the respiratory therapy curriculum. With AI becoming increasingly prevalent in healthcare, it is essential to equip future respiratory therapists with a solid understanding of AI concepts, tools, and applications. By reviewing various educational models and best practices, the presentation will highlight key strategies for incorporating AI into respiratory therapy programs, fostering a generation of healthcare professionals who are proficient in the use of AI technologies. Next, the presentation will delve into the practical application of AI in respiratory therapy. Specific examples of AI-driven innovations, such as predictive algorithms for patient deterioration, advanced ventilator management, and automated diagnosis of respiratory conditions, will be discussed. These case studies will demonstrate the real-world impact of AI on patient care, highlighting improvements in efficiency, accuracy, and patient outcomes. Despite the promising potential, the presentation will also address the barriers to AI adoption in respiratory therapy. Issues such as technological infrastructure, the need for interprofessional collaboration, ethical considerations, and the reluctance to adopt new technologies will be critically examined. Furthermore,

strategies for overcoming these barriers will be proposed, offering actionable insights to help facilitate the implementation of AI in respiratory therapy practice. Finally, the presentation will emphasize the importance of interdisciplinary collaboration in AI-driven healthcare. Respiratory therapists, educators, technologists, and policymakers must work together to ensure that AI education and practical application are aligned with evolving industry standards. In conclusion, this presentation will provide attendees with a comprehensive understanding of how AI can be integrated into respiratory therapy curricula and successfully applied in clinical practice. By bridging the gap between education and implementation, respiratory therapists will be better equipped to leverage AI to enhance patient care, making a significant impact on the future of respiratory therapy.

WORKSHOP

RESPIRATORY CLINICS: WHAT CAN WE LEARN FROM OTHER CLINICS? THEIR VICTORIES, THEIR FAILURES, AND THEIR INNOVATIONS

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Background: The primary care landscape in Canada has changed. Certified respiratory educators are being asked to not only deliver evidence-based care to patients with asthma and/or chronic obstructive pulmonary disease (COPD), but also to manage, operate, and, sometimes, create respiratory clinics. As RT educators, we learn how to educate patients about their disease and often help in the decision-making process for treatment, however, we may not have learned how to manage and operate these Respiratory Clinics.

Method: Our Respiratory Health Clinic had to become efficient, accessible, and proactive. The evolution and framework of our Respiratory Health Clinic took time, but the clinic can now recognize the need for change and have learned to embrace it.

- We prioritize every consultation to ensure timely access depending on the patient's condition.
- We organized our daily and weekly schedule to balance in-person consults and telephone follow-ups.
- We measured the clinic's capacity to know how many patients the clinic can handle monthly.
- We created an easy way to manage follow-ups.
- We provide eligible COPD patients with an action plan to prevent unplanned doctor visits.

Results: The Respiratory Health Clinic went from serving roughly 60 patients in 2016, to well over 1300, despite only having 2.5 equivalent full time RT educators. We maximize our time; we ensure patient follow-ups are never late, and we work as a team. We learned how to work smarter and not harder. From April 1st, 2023, to March 31st, 2024, the Respiratory Health Clinic performed:

- 416 new asthma consults and 149 new COPD consults.
- 896 spirometry's

- 782 in-person follow-ups
- 1945 telephone follow-ups and 226 telephone interventions

Conclusion: It is incredibly rare, the business (or clinic, in this situation), that cannot find ways of being more efficient, without sacrificing quality. Were we once thought that we could not find more minutes in a day, we would tweak a process, and found more minutes. We found that making small changes can have a large impact. During the workshop, educators will learn from each other and have open discussions about their reality at work. They will have the chance to brainstorm together and to discuss the logistics of their clinic, and the processes that allow their clinic to run smoothly and the processes that hinder progress. The aim of the workshop will be to leave with inspiration and new ideas that can apply to their own practice.

WORKSHOP

RIDING THE WAVE: AN INTRODUCTION TO BEDSIDE LUNG AND VASCULAR ACCESS POCUS

Kimberley Lewis, MD, MSc, FRCPC; Kelly Hassall, RRT, FC-SRT, MEd, BSc; Brandon D'Souza, RRT, CCAA; Mathew Kiberd, LCdr, MD, FRCPC; John Plumb, RRT; Dr. Laiya Carayannopoulos, MD, MSc, FRCPC; Sam Salamone, RRT, CCAA

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Background: Point of care ultrasound is a diagnostic tool that can be readily used by Respiratory Therapists at the bedside to enhance safety and efficiency in patient care. Point of care ultrasound has not been traditionally incorporated in entry to practice competencies for Respiratory Therapists thus access to resources and education for point of care ultrasound is necessary.

Methods: An interprofessional team led by ICU physician Dr. Lewis and consisting of an Anesthesia Assistant (John Plumb), a Respiratory Therapist (Kelly Hassall) and an additional Critical Care Physician (Dr. Carayannopoulos) have created a hands-on workshop for Respiratory Therapists to learn about the integration of point of care ultrasound into clinical practice. The workshop will begin with an introductory overview of the clinical application of point of care ultrasound for lung and arterial line insertion. The participants will then be divided into groups and move through six stations to gain hands-on training in image acquisition and recognition. Feedback will be collected to guide future online education and workshops through the CSRT.

Results: The anticipated results of this workshop would be for Respiratory Therapists to have the basic knowledge and understanding of the use of point of care ultrasound to support future discussions of integration of this clinical tool into clinical practice.

Discussion and Conclusions: This workshop is intended as an opportunity to provide consistent introductory resources and education to the Respiratory Therapists across the country. Based on feedback generated during this workshop, the facilitators will be able to work with the CSRT to continue to provide meaningful education and

resources regarding point of care ultrasound to Canadian Respiratory Therapists.

HEATED HIGH FLOW HUMIDIFICATION DEVICES IN ADULTS WITH AND WITHOUT TRACHEOSTOMY- CASE BY CASE PROVISION FOR NEED, NOT WANT

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Heated High Flow Humidity therapy is readily available in acute care facilities to the full spectrum of patients with or without tracheostomy. Funding is accessible for this treatment to pediatric tracheostomy patients if they are shown to have failed standard humidity therapy in hospital. Adult tracheostomy patients typically receive less funding for respiratory needs in general in Alberta and are not routinely provided with funding or access to Heated High Flow Humidity therapy. Adult patients with a variety of pathologies in the community with and without tracheostomy can have significantly improved quality of life and potentially better outcomes, supporting reduced medical intervention with at-home Heated High Flow Humidity therapy. Increased awareness of both this therapy and funding opportunities by healthcare providers may benefit this patient population.

MEASURING RESPIRATORY OSCILLOMETRY IN AIRWAY DISEASES, WHY DO WE NEED IT?

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Background/Introduction: Traditional measurements of lung function such as spirometry, plethysmography and gas dilution provide an assessment of flow, volume and resistance, however, they require coordinated efforts between both the user and the patient. Respiratory oscillometry (RO) measures respiratory impedance; the airways calibre/resistance (Rrs), and elasticity/reactance (Xrs) in response to various frequencies of an oscillating flow signal during tidal breathing. Currently, there are two modalities to measure RO; 1) forced oscillometry technique (FOT) and 2) impulse oscillometry (IOS). The utility of respiratory oscillometry has been demonstrated in children and adults across various airway diseases.

Methods: The physiology of oscillometry will be reviewed and compared between FOT and IOS devices. Clinical and disease indices between infants, children and adults will be summarized. The future utility of respiratory oscillometry will be summarized along with gaps in knowledge and challenges that require further investigations.

Results: Respiratory oscillometry has been used in the assessment of lung mechanics in infants, children, adolescents and adults in such diseases as asthma, COPD, obesity, restrictive lung diseases, vocal cord dysfunction, sleep apnea, environmental exposure and those receiving mechanical ventilation. Rrs and Xrs have been measured in pre-term infants and those with bronchopulmonary dysplasia (BPD). RO has been associated with response to bronchodilator and bronchial challenge testing in children and

adults with asthma. In asthma and COPD, it is sensitive to treatment with inhaled bronchodilators and corticosteroids. In addition, there are correlations with oscillometry parameters and change in symptoms, or stability following exacerbations. Clinical relevance of recent observations of intra-breath oscillometry measurements during inspiration and expiration are being evaluated. The effects of biologics on oscillometry and peripheral airway physiology are being evaluated in comparison to advanced imaging of peripheral airway structure and function.

Discussion: Measuring the mechanics of the lung can be completed using respiratory oscillometry. During simple tidal breathing, the collection of oscillation parameters at various frequencies provides information regarding the distal, peripheral and total resistance and the reactance/elasticity of the airways. Both IOS and FOT provide values for Rrs and Xrs but exhibit small differences between device and disease states. RO provides a simplified means of diagnostic testing across all ages and stages of lung diseases.

Conclusions: The use of respiratory oscillometry is relevant in the diagnosis, aid and management of those individuals with airway diseases. It should be used as an adjunctive tool in addition to conventional means of measuring lung function. More research is required to establish minimally clinically important differences within age groups, to predict changes within diseases and treatments, and to evaluate over long term what they add to the current methods of assessing airflow and airway mechanics.

HIGH DOSE AND ULTRA-HIGH DOSE NITRIC OXIDE FOR TREATING RESPIRATORY INFECTIONS AND CANCEROUS TUMOURS: A REVIEW OF RECENT RESEARCH

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For the past 30 years, inhaled nitric oxide has been used extensively to acutely treat pulmonary hypertension. Its direct vasodilation properties are well described and well known, and respiratory therapists have always played a key role in its safe delivery to ICU patients. Recent research suggests that treating pulmonary hypertension may only be scratching the surface of what this important molecule can offer patient care. When used at concentrations in the 150 ppm to 400 ppm range, it exhibits direct anti-viral and antibacterial effects, and may play an immuno-modulatory role in acute viral infections such as COVID-19 and bronchiolitis. The presentation will provide a review of the nitric oxide's anti-viral and antibacterial mechanisms of action, and also review and discuss several patient trials that demonstrate positive effects of high-dose inhaled nitric oxide therapy in the treatment of acute viral and persistent non-tuberculous mycobacterial infections. Additionally, the speaker will describe what it is like to be a respiratory therapist involved with the protocol development, regulatory preparation/submission, logistics planning, clinician and biomed technician training, intra-trial technical and clinical support, and post-trial data exploration of several of these studies. Finally, a brief overview of new and exciting nitric oxide research will be presented,

including anti-tumour therapy with 25,000 ppm NO and evidence for the reversal of autism symptoms in animal models when NO production in the brain is suppressed.

BREATHING IN SYNC: ESTABLISHING BEST PRACTICES FOR MOUTHPIECE VENTILATION AT HOME

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Introduction: Alberta's home ventilation program supports neonates through their growth at home and school, as well as patients with Neuromuscular/Amyotrophic Lateral Sclerosis requiring ventilators. We support mouthpiece Ventilation, BPAP, Tracheal support, and full ventilation.

Background: The traditional approach to mouthpiece ventilation in Alberta required modification with the release of new recommendations and evidence in the last three years.

New approaches required different assessment techniques, tools, and technology for the home ventilation team, as well as a protocol that enabled autonomous practice should prescribers request it if clinic setup is not possible.

Methods/Results/Discussion

- Become familiar with the most recent evidence and guidelines for mouthpiece ventilation.
- Review the various available mouthpiece ventilation pieces available for our patients' available post-worldwide supply challenges.
- Review mouthpiece ventilation assessment standards and the recommended diagnostic equipment for home assessment.
- Explore how to enhance respiratory therapist autonomy and client satisfaction with a mouthpiece ventilation protocol and assessment tools.
- Review virtual data collection reporting standards for clinic assessment visits.
- Review the ventilation parameters including initial settings and monitoring of the patient for comfort. Review pressure versus Volume Control settings for ventilation.
- Coaching techniques to improve comfort and ease with ventilation.
- Review of the different approved ventilators that can perform mouthpiece ventilation in Canada.
- Shifting the fleet of ventilators in Alberta that will include mouthpiece ventilation.

Conclusion: New ventilators have become available within Canada for procurement. We will review our newly chosen ventilator including why it was chosen for Alberta and its functionality for mouthpiece ventilation.

THE STORIED HISTORY OF RACE CORRECTED EQUATIONS AND WHY WE SHOULD STOP

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History: Starting in the early 1800s, experimentation on black slaves by plantation owner physicians began with the motive of justifying slave ownership. The deeply flawed “research” led to the creation of the first spirometer and the theories that black people need slavery to thrive, and this carried through for the next 150 years. Eventually researchers realized that socioeconomic factors experienced disproportionately by POCs are determinants of lung capacity. Yet these equations have been accepted as fact and been the standard until just last year.

Current research and context in the modern world: With the conclusion of the human genome project in 2000, the world had proof that all humans are more than 99% genetically the same. Research began to focus on comparing spirometry results using the race-corrected and race-neutral equations and how this affects the test interpretations. Recognition of non-genetic influences on lung health and the race-neutral genetic differences such as height and age as factors that impact lung function has proliferated. A global working group reviewed all the available evidence which led to the ATS recommendation to stop using race-correction in spirometry in 2023.

Implications of the change and conclusions: Shifting to race-neutral equations has the potential to significantly reclassify POCs disease severity and has widespread implications for their care. It will also impact people who identify as white, but not to the same degree. In the ATS statement, they make recommendations about how to mitigate this, practice race-conscious medicine, and make suggestions for future research. In the end, it’s racism, not race, that impacts how we deliver care.

SIMULATION-BASED INTERPROFESSIONAL LEARNING TO SUPPORT RESPIRATORY THERAPISTS IN END-OF-LIFE CARE

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Introduction: Respiratory Therapists are routinely involved in end-of-life care and compassionate extubation at end of life (EOL). Surveys of Respiratory Therapists’ experiences show that the majority feel they have not had sufficient education and training in EOL discussions. They also feel that they are often not involved in the preparatory meetings with the family and feel that debriefing and psychological support are needed.

Discussion: At Children’s and Women’s, we are piloting an inter-disciplinary, simulation-based approach to provide online education and simulations to prepare the team of physicians, nurses and allied health, including the Respiratory Therapist, in EOL care. The goal of this inter-disciplinary approach is to provide the much-needed education for the team with online asynchronous learning. This is followed by a structured simulation-based learning for the pre-meeting, meeting with the family and carrying out the EOL plan. Guided self-reflection and debriefing post simulation with trained facilitators will support the psychological safety of the participants.

Summary: We are piloting this approach over the next few months and will present our preliminary evaluation data at the forum.

COLLABORATING WITH THE OCCUPATIONAL THERAPIST AND WOUND CARE NURSE TO ADDRESS MASK-RELATED PRESSURE ULCERS IN HOME VENTILATED PATIENTS

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Background/Introduction: In the province of Alberta, a Continuing Care facility must adhere to the Continuing Care Health Services Standards that are set by the Alberta government. Alberta Health, a branch of the Ministry of Health, is committed to supporting the delivery of Quality Health Care to Albertans in the continuing care system through the application of the Continuing Care Health Service Standards. (CCHSS). The CCHSS are a legislated requirement of Operators pursuant to the Continuing Care Regulation under the Continuing Care Act. The CCHSS set the minimum requirement that Operators in the continuing care system must comply with in the provision of publicly funded Health Care. Three out of 20 standards, which are Assistive Equipment, Technology and Medical/Surgical Services (Standard 6.0), Infection Prevention and Control (Standard 11), and Nutrition and Hydration Management (Standard 14), address the current health issues pertaining to pressure ulcers from mask interfaces in Home Ventilated Patients.

Methods/Results/Discussion: The National Pressure Ulcer Advisory Panel reports that medical device-related pressure ulcers account for more than 50% of hospital-acquired pressure ulcers, mainly due to different mask interfaces. Early intervention and collaboration with the Occupational Therapist and Wound Care Nurse reduce the incidence of mask-related pressure ulcers in the home ventilated population. Performance of an initial point of care risk assessment by an Occupational Therapist, Respiratory Therapist and Wound Care Nurse to evaluate the risk factors related to the interaction between a Client and the Client’s environment, which includes the Home Ventilators, addressed the pressure ulcers and led to the prevention and lessening of the severity of pressure ulcers. From the point of care assessment, the RRT, OT and Wound Care nurse will create a care plan that includes different assistive technologies and equipment, wound dressings and diet plans specifically addressing the need of a home ventilated patient.

Conclusion: With this early collaboration with Respiratory Therapist, Occupational Therapy and Wound Care Nurse to address pressure ulcers, there are reductions of pressure ulcers in a continuing care setting.

MANAGING UPPER AIRWAY OBSTRUCTION IN THE PFT LABORATORY

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Pulmonary Function Testing is a combination of spirometry, lung volumes and diffusion capacity testing that is either performed in an inpatient or an outpatient setting. The vast majority of findings are for lung obstructive (Asthma/COPD) or restrictive (IPF/ILD/Sarcoidosis) conditions. On rare occasion, patient undergo testing in a PFT lab with upper airway obstruction. Respiratory Therapists are to perform full Pulmonary Function Testing to ATS criteria and examine the obtained FVL and body plethysmography Raw. Patients with extrathoracic upper airway obstruction show a flat inspiratory loop and patients with intrathoracic upper airway obstruction show a flat expiratory loop on spirometry. Having the ability to recognize upper airway obstruction in the PFT lab will allow the respiratory therapist to be able to notify the referring physician immediately prior to waiting for an interpretation. Upper airway obstruction, when identified at point of testing and early intervention is immediately sought, can significantly reduce the incidence of hospital admission including preventing endotracheal intubation and mechanical ventilation. When providing in depth training to pulmonary function technicians to assist in the identification of upper airway obstruction to be able to expedite intervention patient outcome substantially improve. This training is essential for any community care RT providing any kind of pulmonary function testing where it be Full Pulmonary Function Testing or Simple Spirometry.

“CLEARING THE AIR” THE RISE OF RESPIRATORY THERAPY IN CHINA

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I will be speaking about my personal experiences with the development of the Respiratory Therapy profession in Mainland China. I will be describing my work over the past 20 years with several different programs/organizations that have supported Specific Hospitals in three main areas of China. This work initially started with my involvement with an International Collaboration between the Canadian Neonatal Network and the Chinese Government to develop and support an International Neonatal Fellowship Training Program out of Shanghai's Fudan University Children's Hospital. This program was taught from an interprofessional lens and many RRT's practicing in NICU's from across the country participated. My involvement in this program really highlighted to me the need for Respiratory Therapists in China. I was able to connect with scattered Respiratory Therapists around the country to learn about the very beginnings of our profession in China. From my exposure with this program, I was then involved with another Interprofessional training opportunity sponsored by Children's Heartlink to support a 10-year program to enhance the Pediatric Cardiac Surgical program at Huaxi Hospital, an affiliate of Sichuan University in Chengdu, China. This program introduced me to a hospital that has a formal Respiratory Therapy Department that functions very similar to what we have across Canada and North America. This proved to be an excellent collaboration that led to ex-

change programs that included RT's coming to Canada to observe as well as collaborative Quality Improvement projects. There are still open channels of communication between our two hospitals. Lastly, through SickKids International, I have worked with another center in Tianjin, China, to help support a children's cardiac surgical program. Again, this partnership has been an interprofessional project that has even included the development of a curriculum for nurses that volunteered to train as Respiratory Therapists. My hope is to share an inspiring story about our profession, the need for Respiratory Therapy internationally and to provide people with ideas and avenues for getting involved in international work.

WORKSHOP

SLOWING THE COPD REVOLVING DOOR: GROUNDING FREQUENT FLYERS

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Background: Chronic Obstructive Pulmonary Disease (COPD) remains the 2nd highest reason for hospital admission. The biggest indicator for repeat acute exacerbation of COPD (AECOPD) is having had a previous exacerbation. This leads to increased emergency department visits and to subsequent hospitalizations. Exacerbations increase the mortality risk for those living with COPD, they significantly reduce exercise capacity and function, as well as the quality of life of the patient. Together with the shortages experienced with primary care physicians nationwide, it is easy to witness how emergency departments become a “revolving door” for patients living with COPD. We propose the use of Pulmonary Rehabilitation (PR) as a routine component of discharge planning from acute care to provide a continuum of care for patients experiencing an AECOPD. Acute care Respiratory Therapists can be instrumental in implementing this initiative.

Methods: A traditional narrative literature review is conducted to provide a broad overview of the effectiveness of PR post COPD exacerbation vs. usual care for both in-person and telerehabilitation programs. Secondary data from an original systematic review on the characteristics of effective maintenance PR programs will highlight the basis for connecting those experiencing an AECOPD who have already completed a PR program back to that program for maintenance PR. Case based examples of behaviour change strategies, such as brief intervention techniques, will be examined so that acute care RT's working in ER and hospital wards can feel confident in introducing PR as a treatment strategy for those living with COPD.

Discussion: Pulmonary rehabilitation has shown to be effective in reducing exacerbations and reducing healthcare utilization especially if implemented within 4 weeks of a COPD exacerbation. The secondary data from our systematic review on characteristics of effective maintenance programs shows that maintenance PR programs can reduce AECOPD and healthcare utilization rates. The positive outcomes of PR programs start to decrease after 6 months

if an exercise maintenance program is not initiated. This supports reconnecting those who have experienced an AE-COPD back to a PR program (even if they have previously attended a program), or into a PR maintenance program. The ability of PR programs to focus on education, self-management, and exercise provides the necessary care to support patients recovering from an exacerbation. Participants learn self-management tools and healthy living strategies that can reduce exacerbations and hospital admissions. Behaviour change tools are an effective way for acute care RTs to introduce PR as a treatment option for their patients. Healthcare workers have successfully implemented “brief interventions” to motivate their patients to make healthy lifestyle choices. With acute care workloads being high, time spent with patients must be efficient.

Conclusion: The gap between acute and primary care respiratory therapy for the COPD patient is often overlooked. This “missing handover” can be minimized through the use of existing PR programs which provide a natural transition for those experiencing an AECOPD from acute care RT management to primary care RT management. By teaching brief intervention tools to acute care RTs to introduce PR as the bridge between acute and primary care, we hope to decrease this gap in care, effectively “grounding frequent flyers”.

FRIDAY, MAY 9, 2025

ASSESSING AIRWAY CLOSURE IN MECHANICALLY VENTILATED PATIENTS

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Recent research has provided valuable insights into the phenomenon of airway closure, a condition that has significant implications for patient care in critical settings. Airway closure refers to the collapse of small airways during expiration, preventing the proper exchange of gases. This phenomenon is concerning in patients with Acute Respiratory Distress Syndrome (ARDS) and in those who are obese. Studies indicate that airway closure occurs in over 30% of patients diagnosed with ARDS and affects approximately 22% of obese patients, making it a common issue in intensive care settings. The consequences of airway closure are far-reaching and can complicate the management of ventilated patients. One of the most immediate effects is atelectasis, where portions of the lung collapse, reducing the area available for gas exchange. This leads to impaired oxygenation and ventilation-perfusion (V/Q) mismatch, a condition in which air reaching the lungs does not meet the blood flow, further compromising oxygen delivery to tissues. Moreover, airway closure places physical stress on the small airways, which can lead to injury over time, exacerbating the patient's condition. In addition to these mechanical effects, airway closure complicates the assessment of lung mechanics during ventilation. When the airways are closed, common ventilator measurements such as driving pressure, respiratory system compliance, and the re-

cruitment-to-inflation ratio can be misleading. Inaccurate readings can lead to inappropriate ventilator settings, potentially worsening the patient's condition or delaying necessary interventions. For this reason, it is critical to assess airway closure accurately to ensure optimal ventilatory support. Fortunately, identifying airway closure in a clinical setting is not a complex task. Modern ICU ventilators are equipped with tools that allow healthcare providers to assess airway closure with ease. The procedure takes less than one minute to perform and involves measuring key ventilatory parameters at the bedside. By recognizing airway closure early, clinicians can adjust ventilator settings to reopen closed airways, improving gas exchange and reducing the risk of further complications. This presentation will dive deeper into the research surrounding airway closure, providing an evidence-based review of its prevalence, consequences, and clinical significance. Furthermore, it will offer practical guidance on how to perform airway closure assessments at the bedside, empowering RTs to optimize care for ventilated patients. Understanding and managing airway closure is a critical step toward improving outcomes in patients with ARDS, obesity, and other conditions that predispose them to this under-recognized issue.

BREATHING MECHANICS: USING RESPIRATORY ASSESSMENTS TO CREATE WELLNESS WITH COPD

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Background: Those with COPD have significant physical changes to how they breathe which limits their ability to function and their quality of life (QoL). If these mechanics were improved and participants participated in a breathing and education program, would patients have improved physical ability, QoL and reduced anxiety? Would they be more empowered to self-manage at home? These questions were addressed in a small pilot study.

Methods: Exercises were created to improve breathing mechanics (specifically diaphragmatic engagement and strength, chest wall expansion and reducing shoulder tension). These, along with education, were taught over a six-week period. Measurements recorded include walking speeds, oxygen levels, and self-reported wellness.

Results: Participants reported improved levels of energy and QoL along with a reduction in shortness of breath and anxiety. They reported higher oxygen saturations (up to 4% in severe

COPD), improved walking times and duration, and greater capacity for physical activity.

Discussion: In preliminary results, participants noticed significant benefits from a six-week pulmonary wellness program that focused on breathing mechanics and education. The results were evident more quickly than anticipated. Within the first two weeks that focused on diaphragmatic engagement and chest wall expansion, participants noticed less frequent shortness of breath. Indications to date also show this has the potential to reduce the frequency of future medical intervention in the ongoing treatment of the patient's COPD. Emphasis needs to be placed

on personalized support, and one of the greatest concerns moving forward is long-term support as they continue to navigate their well-being. A frequently cited frustration and incidental finding of this pilot project is that patients struggle to navigate their own journey through healthcare and would warmly receive support in this area.

Conclusions: This is a promising study showing that there can be significant improvement in COPD recovery when breathing mechanics are considered. These findings warrant further study and education of breathing mechanics, breathing assessments and COPD care.

WHEEZY OLYMPIANS: UPDATED GUIDELINES AND NEW EVIDENCE

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Background: It is surprising to many that a high proportion of competitive athletes have asthma. In some sports, the rate of asthma is two to five times higher than in the general population.

Respiratory therapists (RTs) are often involved in the education of people living with asthma, so RTs should be aware of the international requirements for diagnosis, as well as inhaled medications that are prohibited and those that are allowed.

Methods: The presentation will detail the respiratory physiology and pathophysiology involved in high-risk sports involving very high rates of ventilation, leading to excessive airway drying and consequently, hyperresponsiveness. Various environmental factors involved in the performance of high-risk sports will be discussed.

Results: Recent evidence will be reviewed detailing rates of asthma in specific high-risk sports as well as evidence-based strategies to reduce the risk and manage asthma in these sports. The presenter will also share their own evidence from assessing, interviewing, educating, and studying elite athletes with asthma. The recently updated (2023) World Anti-Doping Agency (WADA) regulations for asthma will be reviewed including the diagnostic tests to provide sufficient evidence of airway hyperresponsiveness, including pre/post bronchodilator spirometry and bronchial provocation testing. Inhaled respiratory medications that are permitted as well as those prohibited will be reviewed, including the process involved for a therapeutic use exemption, as detailed by WADA regulations.

Discussion: The audience will be engaged to share their own experiences while assessing, testing, and educating elite athletes with asthma. RTs in attendance will also be asked to share their experiences with specific diagnostic tests for asthma in athletes as well as their use of common inhaled respiratory medications, both permitted and prohibited inhalers.

Conclusion: It is important for RTs to be aware of the international regulations for athletes with asthma. This session will review the updated guidelines and new evidence related to the high rate of asthma among athletes in some high-risk sports.

IMPLEMENTATION OF A CPR COACH ROLE FOR IN-HOSPITAL RESUSCITATION TEAMS

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Background/Introduction: The role of the CPR coach as part of resuscitation teams was introduced in the 2020 guidelines for both advanced and basic life support programs through the Heart and Stroke Foundation. The main purpose of the CPR coach role is to improve the team's adherence to CPR guidelines, ensuring high-quality CPR during cardiac arrest, and helping to reduce the cognitive load from the code team leader, allowing them to focus on other elements of advanced life support management. While CPR coaching often occurs already, there is a lack in formal guidance in how to purposefully train individuals to fill the role and how to integrate the new role into existing resuscitation teams.

Methods: An interprofessional working group undertook a quality improvement project to operationalize a training curriculum for the CPR coach, as well as an integration and sustainability plan for embedding the CPR coach into existing resuscitation teams at a pediatric hospital. A needs assessment was conducted to understand the perspectives of existing resuscitation team members. A review of the literature and organizational benchmarking was conducted to understand the current landscape of CPR coaching for resuscitation teams. The QI project team developed a project plan, and curriculum development was guided through use of the ADDIE framework. Simulation-based education was the primary modality chosen for the training curriculum, including the use of rapid cycle deliberate practice (RCDP). The curriculum is composed of an asynchronous online learning module, followed by in-person simulation-based training and competency-based evaluation.

Results: Since June 2023, there have been 54 individuals trained to fill the role of the CPR coach for in-hospital resuscitation. 117 individuals have completed a virtual online module pertaining to the role of the CPR coach. The CPR coach role has been successfully integrated into the in-hospital code blue and emergency department teams. From Sept 2023- March 2025, there has been 93% uptake of the CPR coach role during cardiac arrest events in these areas. There has been 100% compliance with a discussion of the CPR coach role during debriefing of cardiac arrest events in these areas. The integration of a CPR coach role into these teams has also contributed to overall adherence to CPR guidelines and achievement of CPR quality metrics.

Conclusion: The project team has demonstrated the successful and sustainable integration of a CPR coach role for in-hospital resuscitation teams utilizing a quality improvement methodology. The consistent and effective use of a CPR coach during resuscitation helps the team achieve target CPR quality metrics and may mitigate cognitive load for the team leader, who can reallocate focus to other as-

pects of advanced life support management. The RRT may interact with the CPR coach role or fill the role during resuscitation events. It is important that there is a shared understanding of the role and how the RRT and CPR coach may work together to improve CPR quality.

WORKSHOP

AIRWAYS UNLOCKED - TECHNIQUES FOR TRICKY SITUATIONS

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This advanced airway workshop is designed for practitioners with strong foundational airway skills and anesthesia experience who seek to expand their capabilities in managing complex airway scenarios. Following the American Society of Anesthesiologists' Difficult Airway Algorithm as a framework, participants will rotate through five specialized stations focusing on techniques rarely practiced in routine clinical settings but critical during challenging airway situations. Participants will gain hands-on experience with lung isolation techniques using various double-lumen tubes and bronchial blockers, advanced video laryngoscopy with multiple adjuncts including fiberoptic-assisted approaches, light wand intubation for patients with limited mouth opening or fragile dentition, conversion from supra-glottic rescue devices to definitive airways using exchange catheters, and front-of-neck airway access techniques for cannot intubate, cannot oxygenate scenarios. Each station emphasizes equipment selection, technical skill development, and clinical decision-making in a supportive learning environment. By workshop completion, practitioners will have enhanced confidence in applying these specialized techniques, improving their preparedness for managing difficult airways in clinical practice.

ASSESSING THE VALIDITY OF AIRWAY OCCLUSION TECHNIQUES TO DETERMINE INSPIRATORY EFFORT DURING NONINVASIVE IN HEALTHY SUBJECTS

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Background/Introduction: Excessive respiratory effort can increase the risk of patient self-inflicted lung injury in patients receiving non-invasive ventilation (NIV). The esophageal balloon is the reference technique for monitoring respiratory effort. However, esophageal manometry is semi-invasive, uses dedicated equipment and is time consuming. We undertook to establish whether non-invasive measures of respiratory drive and effort measured using the ventilator while applying positive airway pressure via face mask interface reflect respiratory effort and load.

Methods: Healthy volunteers were recruited. After placing an esophageal balloon, CPAP 1 cmH₂O was applied using NIV on the Getinge Servo U ventilator. Key parameters

of peak airway pressure, respiratory rate, tidal volume, flow, Pes, PLdyn, Pocc and P0.1 were measured on the ventilator and FluxMed under varying conditions: CPAP 1 cm H₂O, after applying deadspace (300 cc), inspiratory resistance (Rp 50), expiratory resistance (Rp 50), deadspace with inspiratory resistance (Rp 50), and at CPAP 5 cmH₂O and CPAP 10 cmH₂O. Pmus was computed from estimated chest wall elastance.

Results: Twenty subjects were enrolled. Pmus, Pocc, and P0.1 but not respiratory rate increased with applied inspiratory and expiratory resistance loads. P0.1 measured on the ventilator were correlated with Pmus (marginal R²0.21, conditional R²0.64, p<0.001); the correlation between Pocc and Pmus was weaker (marginal R²=0.05, conditional R²=0.56, p=0.01). Respiratory rate was inversely associated with respiratory effort (marginal R²=0.06, conditional R²=0.48, p=0.02). P0.1 was sensitive and specific for the application of the high load condition (inspiratory resistance + dead space; AUROC 0.90, 95% CI 0.83-0.98).

Discussion: P0.1 and Pocc were sensitive to increases in respiratory effort in response to increases in respiratory load. P0.1 exhibited the strongest correlation with respiratory effort, accurately discriminating between higher and lower loading conditions. Furthermore, Respiratory rate was a very poor marker of respiratory effort under the varying loading conditions.

Conclusion: P0.1 may be a useful parameter to assess for elevated respiratory effort and load during noninvasive ventilation. Further validation in critically ill patients with AHRF is required.

TAMING THE WEST: BUILDING A PRIMARY CARE RT PROGRAM ON THE WEST COAST (VANCOUVER ISLAND)

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Background: Vancouver Island is a Health Authority in British Columbia that had no Respiratory Therapists anywhere other than acute care. There was a high percentage of clients with COPD and high admission rates. A proposal was put in to create Respiratory Therapy in Community (RTIC). The proposal was led by a project team, and once it was approved, the 4 phase implementation started. There were timelines to adhere to and outcomes that were monitored closely with the monthly reporting structure to the executives in the health authority.

Methods: This project was done using a project team and subject matter experts. There was no template for the creation of a program like this, so there was careful planning and engagement to ensure we were creating what the communities needed. The hiring of the RT's and FTE was all based on data of COPD clients and hospital admissions in each specific health region. Key progress points were highlighted monthly, and new ones were planned for the next month to keep the project moving forward. Issues and risks were addressed and highlighted routinely, so there was clarity to all involved. Numerous PDSA cycles were done throughout this project to improve our outcomes.

Results: After 2 years of project work, and the scope being expanded a couple of times, RTIC is now an operational part of Community Health Services in Island Health. We have a COPD care model to use throughout our Health Authority. Our long-term outcomes have been achieved, and our program is fully functional. We have collected data and achieved our outcomes of >90% of our COPD clients having COPD action plans and understanding of how to use them, and pre/post Respiratory education programs survey resulted in a doubling of clients' knowledge of COPD and confidence.

AIRWAY MANAGEMENT DURING CARDIAC ARREST – TO DO OR NOT TO DO?

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Background/Introduction: The optimal approach to airway management during out-of-hospital cardiac arrest is unknown.

Methods: This review summarizes the updated literature on airway management (BMV, SGA, and ETI) during cardiopulmonary resuscitation (CPR). It provides guidance for clinicians to carefully incorporate the most recent recommendations related to airway management, oxygenation, and ventilation both during CPR and after return of spontaneous circulation. Review of current evidence with a focus on the PART, Airways 2 and CAAM randomized control trials.

Results/Discussion: There are pros/cons to all devices, and there is no evidence that any single advanced airway technique is superior to the other in terms of survival and neurological outcomes. There is controversy as to whether early advanced airway management could lead to a favourable or detrimental outcome. The key is training and competency on the device being used to increase first pass attempt.

Conclusion: Among patients with out-of-hospital cardiac arrest, the advanced airway management of Bag mask ventilation vs. supraglottic airway device vs. tracheal intubation didn't show a difference in functional outcome at 30 days. Choice of devices depends on training and competency. Future research on IHCA is coming soon (Airways 3 and HART trial).

QUALITY IMPROVEMENT: USING LEAN METHODOLOGY TO IMPROVE EQUIPMENT OPERATIONS AND PATIENT CARE

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Introduction: In our quality improvement initiative (QI), we aimed to optimize Respiratory Therapy (RT) equipment management across our organization with the goal of having "the right RT equipment at the right place, at the right time." A key performance indicator was the reduction of steps walked by RT staff to provide patient care. The target was to decrease these steps by 10% to ensure timely access to life-saving equipment by September 2024.

Rationale/Objectives: A pre-QI survey revealed significant dissatisfaction with current RT equipment storage, particularly in the (Cardiac Care Unit) CCU, Emergency Department (ED), and Paediatric (Paeds) areas. Only 15% of staff were satisfied with the organization, while 65% expressed dissatisfaction. The objective was to reduce the number of steps walked by RT staff, from the baseline of 12,462 steps, by 10%, thereby enhancing efficiency and patient safety.

Methods: We employed Lean 5S methodology to address the identified issues. This involved sorting and decluttering storage rooms, inventorying necessary items, and collaborating with managers to optimize storage space. Standardized procedures were implemented, including inventory lists, reorder minimums, and weekly ordering schedules. Just-In-Time (JIT) principles were applied to maintain organized and clean storage spaces. Steps walked by RT staff were measured before and after the intervention to assess improvement.

Results: The implementation of Lean improvements yielded significant results: Paeds and ED: Steps walked were reduced by 42% CCU: Steps walked were reduced by 40% Adult ED: Steps walked were reduced by 83% Overall, steps walked were reduced by an average of 56%, surpassing the initial goal of 10%.

Conclusions: The Lean improvements significantly reduced the number of steps RT staff needed to walk, enhancing their efficiency and focusing more on patient care. This reduction also minimized risks related to cross-contamination and improved overall satisfaction with equipment management. The success of this initiative underscores our commitment to improving RT services and high-quality healthcare delivery. Plans are underway to extend these enhancements to additional departments and areas across the organization.

STAY CONNECTED

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Background: Mechanical Ventilation (MV) has been used for decades and has contributed to the survival of patients in Acute Care settings. With increasing ease to transfer patients to different units, such as radiology for imaging, the number of ventilator disconnections has been a constant concern. Although risks associated with MV and circuit disconnects, such as Ventilator Acquired Pneumonia (VAP), ventilation-induced lung injury (VILI), and derecruitment are well known; clinicians often fail to mitigate these risks. Moreover, circuit disconnections are linked with increase staff exposure to biological aerosols. This Case Report aims to identify if the usage of a novel ventilator circuit disconnection adapter may lower the number of circuit disconnections and if it may help lower occurrences of derecruitment.

Methods: This Case Report includes 30 adults of all ages and all diagnoses who required intubation and mechanical ventilation during their hospital stay between August 2024 and March 2025. Adults will be allocated into two groups: historical practice and novel circuit adapter, for which con-

stant monitoring of VCO₂ will be used to identify derecruitment events.

Results: All results are still preliminary as it is an ongoing study. Another in-vitro study was conducted by Merhi & et al. in 2020, where the usage of a disconnection adapter was shown to decrease exposure among clinical staff to aerosols emanating from the circuit. Literature also suggests avoiding ventilator disconnection could reduce derecruitment, VAP and VILI.

Discussion: Although Merhi & Al. found disconnection adapters were shown to be beneficial; more in vivo data are needed to establish correlations in clinical settings. Whether the usage of disconnection adapters improves outcomes in patients or not will be a question for further studies.

Conclusion: Disconnection adapters show promising potential by providing a clinician-friendly substitution to the historical tube clamping technique.

MEDICAL PROCEDURES AND THEIR IMPACT ON PEDI- ATRIC MENTAL HEALTH

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Background: Exposure to invasive medical procedures can have a lasting impact on the mental health and development of pediatric patients. Children living with chronic illnesses experience a range of emotional and psychological challenges as a direct result of the pain, stress and lack of autonomy associated with their ongoing medical care.

Methods: A comprehensive review of research and best practices across psychology and pediatric acute care settings was examined for the impact of medical interventions on pediatric mental health. Additionally, existing methods used by healthcare professionals, families and pediatric patients alike were assessed for their efficacy to reduce or alleviate negative mental health outcomes within this population.

Results: Compared to non-hospitalized peers, PICU admissions were associated with a 5-fold increase in risk of future mental health crises, including the development of post-traumatic stress disorder (PTSD), anxiety, depression, and aversions to future medical treatments. The utilization of tools such as distraction strategies, increased patient communication, family support, and pharmaceutical interventions have shown effective in reducing or preventing many adverse mental health outcomes if implemented consistently by healthcare providers.

Discussion: Respiratory Therapy procedures associated with an increased risk of adverse mental health outcomes include needle pokes, suction, and mechanical ventilation, to name a few. Further discussion around the implication of these necessary but invasive procedures will include examining best practice tools aimed at improving short and long-term mental health outcomes for respiratory patients.

Conclusion: Painful and traumatic medical treatments can have far-reaching effects on the psychosocial development and outcomes of pediatric patients. The consistent implementation of tools to increase patient autonomy and

limit negative emotional responses before, during, and after medical procedures is essential to lessening the immediate and long-term impact on the mental health of pediatric patients.

OBJECTIVELY MEASURING RESPIRATORY SERVICES DATA: THE RESPIRATORY SERVICES INDEX TOOL

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Background: Traditional metrics like a ratio of beds/RT, or ventilator/RT, does not adequately reflect workload for respiratory departments. A few unstable clients, both intubated and non-intubated, represent significantly more work for staff than a fleet of beds or ventilators occupied by relatively stable clients. Workload also depends on role clarity, specialized services, and protocols utilized by the respiratory team.

Purpose: To develop a respiratory services index tool that objectively measures respiratory services that can account for the unique practices, certifications, and clinical workload that accurately reflects the balance between staffing and clinical need.

Research Methods: Operational managers will validate the draft tool in early 2024. A 2nd round of blinded validation will occur between operational managers and clinical leads in the summer of 2025.

Conclusions: Preliminary results will be shared at the CSRT conference in May of 2025, with the intention to publish in the CJRT by the fall of 2025.

UNDERSTANDING COMPLEX EXTUBATION READINESS ASSESSMENTS – INTEGRATION OF MACHINE LEARN- ING TECHNOLOGY

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Background: In the data-rich critical care environment, clinical decision-making is often a complex, multifaceted, and cognitively loaded process. Evaluating extubation readiness in invasively ventilated critically ill patients can pose a significant challenge to the multidisciplinary care team. Extubation decision-making requires clinicians to carefully evaluate the data available to them, balancing the benefits associated with early ventilator liberation with the potential risks and complications associated with premature or failed extubation. How clinicians evaluate this data and report extubation readiness is also variable. Optimizing the likelihood of successful extubation requires comprehensive and reliable strategies to predict extubation failure. Bedside clinical support tools offer clinicians the opportunity to combine clinical expertise with real-time data generated from bedside monitors and physiological response to intervention(s) to best support the extubation decision-making process.

Discussion: In this session, we will provide an overview of machine learning and predictive analytics and how these bedside support tools can influence clinical decision-making.

ing, with a focus on ventilator liberation and extubation readiness. We will discuss how heart rate and respiratory rate variability during the spontaneous breathing trial can offer additional information on extubation readiness, currently not captured with traditional bedside monitoring. Finally, lessons learned from the bedside implementation of Extubation Advisor, a novel clinical decision support tool to assess extubation readiness in critically ill adults, will be shared.

Conclusion: The convergence of clinician expertise and machine learning technology offers a new era of innovation and promise in a rapidly evolving healthcare landscape. Clinical decision support tools hold promise as a strategy to transform how clinicians process, synthesize, and integrate data into bedside decision-making with the goal of improving patient outcomes.

CIGARETTE SMOKING IN CANADIAN ADOLESCENTS: A CROSS-SECTIONAL EXAMINATION OF PSYCHOSOCIAL DETERMINANTS

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Rationale/Background: Tobacco use is a modifiable risk factor that leads to disease and death in Canada. Notably, it increases the risk for lung cancer along with at least 15 other types of cancer. Use of tobacco products is started and becomes established mainly during adolescence. Thousands of Canadian youth begin smoking every year despite rigorous campaigns and policy aimed at reducing this. With increases in the usage rates of other substances such as vaping, research focus has shifted away from cigarette smoking, but understanding the risk and protective factors associated with cigarette smoking is critical to continued development of targeted interventions.

Research Questions: Is there an association between rates of cigarette smoking and psychosocial determinants among Canadian adolescents? Specifically, the relationships between cigarette smoking and sociodemographics, intrapersonal determinants, interpersonal determinants and context-level determinants were observed.

Methodology: The Health Behaviour in School-Aged Children (HBSC) Survey is a national, cross-sectional study in more than 50 different countries (in collaboration with the World Health Organization) including Canada. The HBSC survey is distributed in grades 6-10 across Canada. This study utilized data from the 2022-2023 HBSC Canadian survey, which collected information through either electronic or paper-based anonymous surveys. The independent variables that were analysed included: sociodemographic variables (grade, gender, relative family affluence and race/ethnicity), substance use, physical activity, mental/emotional well-being, family, friend and peer support, school support, neighbourhood social cohesion, and digital environments. Descriptive statistics were calculated for non-smokers versus ever-smoked. Logistic regression analysis was completed for multiple variables as possible predictors of smoking. Nested hierarchical multivariate lo-

gistic models were performed to adjust for the effects of outcome variables to help predict susceptibility to cigarette smoking.

Results/Findings: Bivariate analysis showed significant associations with all included predictor variables. Fully adjusted hierarchical model showed significant associations between cigarette smoking and other substance use (vaping and alcohol). Higher friend support was a significant risk factor. Higher relative family affluence, gender (cis-girls) and increased family and teacher support were significant protective factors.

Conclusion: Adolescent cigarette smoking remains a public health concern in Canada. A cross-sectional profile of psychosocial determinants of Canadian adolescent cigarette smokers was created. Future research should focus on continued monitoring of cigarette smoking trends in this population.

DELIRIUM: MORE COMMON THAN YOU MIGHT THINK

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The importance of delirium as a major factor in patient outcomes is increasingly being recognized, be it for patients on the Intensive Care Unit, in surgery or on general wards. The speaker has experienced the impact that delirium can have on patients and their caregivers as her mother who was hospitalized in 2021, ended up suffering from delirium which resulted in her inability to return to her home of 53 years, and the need for an admission into assisted living facility. This presentation will review the prevalence of delirium within the hospital setting, identify the symptoms of delirium, describe the subtypes and predisposing factors of delirium. Next it will explore the impact of delirium on the patient and the hospital, lastly the importance of interdisciplinary team in the prevention of delirium. While delirium is associated with higher morbidity and mortality, the good news is that there is a whole list of relatively straightforward measures that can be put into place to substantially decrease the risk of delirium with all its consequences and concomitant symptoms.

RESPIRATORY THERAPY PATIENT-TO-THERAPIST RATIOS: "PANDEMIC'S OVER - NOW WHAT DO WE DO?"

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Background: One of the most long-term and contentious topics in Respiratory Therapy is the Respiratory Therapist Workload, specifically, the appropriate number of patients assigned to an individual respiratory therapist. The SARS-CoV2 "COVID 19" Pandemic demonstrated the frailty of fixed staffing models in delivering patient care excellence, but also the psychological and physiological impact on Respiratory Therapists. Equally emphasized was the very specialized role of the Respiratory Therapist in providing skilled services ubiquitous in the Canadian Healthcare System. Respiratory Therapy in Alberta, while not markedly

different than other provinces and territories, certainly has a wide range of staff to patient ratios.

Methods: This presentation will compare and contrast the limited available worldwide research regarding staffing models and impact upon Healthcare Professionals in general, and Canadian Respiratory Therapists specifically, along the 15-year para-pandemic timeline with the current traditional staffing models in Alberta. Presenting workload and patient-to-staff ratios, implications to the Respiratory Therapy profession, the Canadian Healthcare System, and the individual Respiratory Therapist.

Results: Current staffing practices demonstrate a wide range of variability when compared to the best-evidenced recommendations. These variances have either a direct or indirect effect upon the individual Respiratory Therapist (employment & professional satisfaction), the Respiratory Therapy Profession, and Canadian Healthcare System. Hypothetical influences to explain the disparity will be presented. Examining the current trends when compared to the published findings and recommendations will provide insight into disparities that exist, and the potential reasons why.

Discussion: Through the presentation a review of the results will provide insight into the progress in staffing model thinking/rationale in both the pre-pandemic and post-pandemic environments. A current understanding from a personal and professional impact will provide an avenue for the direction for future research and implementation to shift the current staffing practices.

Conclusion: This presentation provides a comprehensive overview of the impact of Therapist to-Staffing ratios on Respiratory Therapists, the Respiratory Therapy Profession as a whole, and direction for the future in Healthcare in Canada. An understanding of these factors will better align with the published recommendations and provide a positive change to the delivery of cost-effective Respiratory Therapy in the Canadian Healthcare System.

BREATHE EASY WHILE CARING FOR THE NEURODIVERSE: AN RT'S GUIDE TO UNDERSTANDING AND SUPPORTING THE 1 IN 6

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Background: Neurodivergence affects approximately 1 in 6 Canadians, highlighting the need for Respiratory Therapists (RTs) to understand and support neurodivergent individuals effectively. Despite this need, many healthcare professionals, including RTs, have limited knowledge about neurodiversity and face challenges in assisting this population. Effective communication between healthcare workers and neurodivergent patients is crucial for equity and improving health outcomes.

Methods: This presentation will define neurodiversity, explore its manifestations, and present the latest Canadian statistics and research. Prevalent misconceptions about neurodiversity will be addressed. Practical strategies will be explored that RTs can employ to facilitate comprehension of medical information and support adherence to treat-

ments and therapies with neurodivergent individuals, including those with autism, ADHD, and other neurodiverse conditions. Common communication barriers will be discussed, and evidence-based approaches will be introduced to tailor interactions to meet the unique needs of neurodiverse patients. Key topics include the use of clear and concise language, the incorporation of visual aids, and the importance of creating a supportive and non-judgmental environment. Attendees will gain insights into how to adapt their communication styles and implement strategies that promote effective information exchange, ultimately fostering more inclusive and patient centered care.

Results: Participants will acquire a thorough understanding of neurodiversity and practical insights to adapt their practices, enhancing their ability to assist neurodivergent patients effectively.

Discussion: The presenter, drawing from personal experiences as a family member of neurodivergent individuals, will share relevant stories and insights to enrich the discussion.

Conclusions: All healthcare professionals must educate themselves about neurodiversity and adopt tailored strategies to support neurodivergent patients, ensuring they receive equitable and effective care.

"CARE TRAFFIC CONTROL" PATIENT FLOW BASIC FUNDAMENTALS AND MYTHS: HOW INTERDISCIPLINARY CARE TEAM INCLUDING RRT CAN SUPPORT PATIENT FLOW

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Introduction/Background: Efficient patient flow is essential for optimizing care delivery in Edmonton's health care system, which involves managing the movement of patients from admission to discharge. The Edmonton Zone Integrated Operations Center (IOC) plays a pivotal role in this process. Understanding where patients come from, their trajectory through the system, and their ultimate destination is crucial for improving flow. This presentation introduces the central command concept, "Care Traffic Control," and the principles of Rapid Rounds (RRT) in enhancing patient flow. We will also explore quality metrics, situational awareness, and the evolving role of health care professionals in managing capacity and patient flow.

Methods: A detailed review of patient flow data from the Edmonton Zone IOC was conducted, focusing on entry points, transitions, and discharge outcomes. We examined the principles of a central command centre, including the use of real-time data for decision-making. The presentation also reviews the optimization principles of Rapid Rounds and their impact on patient flow. Quality metrics such as access, discharge planning efficiency, and capacity management indicators were analyzed. Coaching interdisciplinary team members provided insights into the collaborative care model and its influence on patient flow.

Results: Data from the Edmonton Zone IOC indicate that real-time tracking and centralized command will show system bottlenecks and overall reduction in length of stay.

Rapid Rounds facilitated faster decision-making and better coordination across departments. The analysis identified key quality metrics, such as patient throughput and capacity utilization, showing significant improvements when these principles were applied. The collaborative care model has proven effective in addressing capacity challenges and improving patient outcomes.

Discussion: The integration of “Care Traffic Control” through a central command center and the application of Rapid Rounds principles have shown to be effective strategies in optimizing patient flow. Situational awareness around capacity and proactive management through real-time data are essential for addressing the mismatch between demand and capacity. The collaborative care model, supported by RRT, enhances communication and coordination among health care professionals, leading to better patient flow and discharge planning.

Conclusion: To meet the increasing demands on the health care system, professionals must adapt to new roles in capacity management and patient flow. The innovative application of IOC principles and Rapid Rounds can significantly improve patient flow and discharge processes. Health care professionals are encouraged to embrace these changes, leverage their unique skill sets, and actively participate in optimizing patient flow. As the health care landscape evolves, the ability to be nimble and innovative will be crucial in managing capacity effectively and ensuring high-quality patient care.

ASSESSING RECRUITMENT POTENTIAL WITH RECRUITMENT-TO INFLATION RATIO

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The overall impact of positive end-expiratory pressure (PEEP) in patients with acute respiratory distress syndrome (ARDS) is influenced by several factors. One of the key determinants is the number of non-aerated lung units that can be recruited, as well as the ability to do so without overdistending lung regions that are already aerated. This balance is crucial for optimizing lung function without causing additional harm. Modern ARDS guidelines no longer universally recommend a higher PEEP strategy over a lower one. Instead, they recognize that the potential for lung recruitment may play a pivotal role in determining whether a higher PEEP setting will be beneficial for a specific patient. Applying PEEP always involves balancing two competing factors: avoiding alveolar collapse while also preventing alveolar overdistension. Additionally, the effects of PEEP on cardiac function must be considered, as increasing intrathoracic pressure can reduce venous return and impair cardiac output. Therefore, the decision to use higher PEEP should be carefully individualized, taking into account the patient’s overall condition and the potential for lung recruitment. To help make more informed decisions at the bedside, RTs can use a straightforward method available on any ICU ventilator to assess the volume of lung tissue recruited with increased PEEP. This method enables the calculation of the recruitment-to-inflation (R/I) ratio, which

provides a quantitative measure of the degree of lung recruitment relative to inflation. The R/I ratio helps assess whether higher PEEP is likely to open collapsed lung units or simply overdistend already aerated regions. Understanding how to calculate the R/I ratio and interpret its results can provide valuable insight into the complex physiology of individual patients. By using this tool, RTs can make more informed decisions about adjusting PEEP settings, balancing the risks of alveolar collapse and overdistension.

ROLE OF AN RT IN VIRTUAL PULMONARY REHABILITATION: CHALLENGES AND OPPORTUNITIES

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Background: Respiratory diseases are a huge health burden. Although the benefits of pulmonary rehabilitation are well-established, this intervention is frequently inaccessible to patients. Tele-rehabilitation and telemonitoring are promising alternatives to support remote home-based rehabilitation in patients with these conditions. However, further research is needed to assess the effect and feasibility of delivering pulmonary rehabilitation programs using remote methods of assessment and monitoring. Additionally, acknowledging the experiences of respiratory therapists as key professionals in the respiratory care team provides valuable insights that could enhance these approaches and promote more active involvement of RTs in the planning and delivery of these programs.

Objective: To share the challenges and opportunities experienced by a respiratory therapist, along with participant feedback, while contributing to the delivery of a virtual pulmonary rehabilitation program for patients with chronic obstructive pulmonary disease (COPD).

Methods: The respiratory therapist (RT), in a dual role of research assistant and educator, contributed to the organization and implementation of a virtual pulmonary rehabilitation program, part of a study conducted by the Respirability Research Lab at the University of Manitoba, Winnipeg. The RT’s involvement included patient recruitment, content delivery, data collection, follow-up, and other key tasks. Recruitment of COPD participants was conducted with an open-call advertisement through community partners, local organizations, city hospitals, and outpatient clinics, as well as advertising through radio and social media streams. Eligible participants were provided with wearable devices (Garmin SmartWatch & O2 ring monitor) and mobile apps (Garmin, ViHealth, LabFront) throughout the 8-week virtual pulmonary rehabilitation program delivered by Zoom. Participant feedback was collected both throughout the program and at its conclusion, following the final assessment.

Results: Participants highlighted perceived improvements in health, the opportunity to connect with peers also living with COPD, and direct interaction with educators. Some of the main challenges identified by the RT and the rest of the research team included difficulties with recruitment, technological issues, and varying levels of technological literacy. Potential strategies to address the chal-

allenges encountered include extended recruitment periods, active referrals from physicians and clinics, and more flexible scheduling availability

Discussion: Tele-rehabilitation and tele-monitoring show promise for remote COPD rehabilitation, but challenges remain in improving their implementation and adoption. Respiratory therapists bring essential professional, interpersonal, and communication skills that make them valuable members of an interprofessional team, contributing to the successful delivery of virtual pulmonary rehabilitation. As such, they should be more consistently involved in the planning and execution of these programs, in various capacities across both clinical and research settings.

Conclusions: These preliminary results provide insights into the perceived challenges and opportunities of pulmonary telerehabilitation and telemonitoring, while highlighting the valuable role of RTs in organizing, implementing, and contributing to the success of these programs for patients with COPD. The findings on the program's feasibility will be available once the data analysis is complete.

THE UTILITY OF SPUTUM CYTOMETRY IN THE MANAGEMENT OF SEVERE ASTHMA

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Background/Introduction: Airway inflammation is fundamental to the cause and persistence of asthma and other airway diseases. It contributes to symptoms, variable airflow limitation, airway hyper-responsiveness, and structural changes (remodelling). However, the presence and type of airway inflammation can be difficult to detect clinically, delaying the introduction of appropriate treatment. Cellular inflammation in the airway can be accurately and reliably assessed by examining spontaneous or, when not available, induced sputum. Induced sputum cell counts are relatively noninvasive, safe and reliable. They can accurately separate eosinophilic airway inflammation from non-eosinophilic airway inflammation and thus help to guide treatment.

Methods: This presentation will summarize the validated methods, devices and measurements accompanying sputum induction and sputum processing for quantitative cell counts. Following the processing stage of raw sputum, the remaining cells and cell-free supernatant are collected and frozen for future analysis. Phenotyping patients based on the predominant cell type or "bronchitis" provides a strategy for optimal patient management. New laboratory techniques have expanded the use of sputum analysis for observing differences in proteins and other factors that could contribute to developing novel treatments.

Results: The sputum induction procedure has been developed to safely collect expectorated sputum and assess airflow/FEV1, airway hyperresponsiveness/reversibility, tachyphylaxis and laryngeal dysfunction. The processing of sputum and quantification of cell counts provides the degree of "bronchitis" determined by the percentage of eosinophils and neutrophils. It also measures the percent-

age of macrophages associated with smoking, micro-aspiration of lipids (GERD), and aggregation of hemosiderin (left ventricular function). Normal values of sputum cell counts have been validated that predict response to treatment and help prevent future exacerbations in both asthma, COPD and chronic cough. The use of sputum cell counts in severe prednisone-dependent asthmatics correctly characterized those with an eosinophilic phenotype, which benefited from biologic treatment targeted against the eosinophil. The advancement of analytical tools and lab techniques has increased the utility of measurements in sputum when investigated on proteomic and transcriptomic platforms. Future use of the principles of sputum analysis aims to develop point-of-care tests to rapidly assess airway inflammation and improve treatment for those with severe airway disease.

Discussion/Conclusion: The process of sputum induction and measurement of sputum cell counts provides a method to monitor airway inflammation, identify future loss of control and, thus, the need to adjust anti-inflammatory medications in patients with a variety of airway diseases. Its evolution in clinical practice is expanding in "omics" platforms and assays to broaden patients' phenotypes. These additional analytes can contribute to a deeper understanding of the pathobiology of severe airway diseases, leading to timely intervention and optimal patient management.

SHIFTING PERSPECTIVE: THE SCIENCE OF SHIFT WORK AND SLEEP

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Shift work has a long history, dating back to the Industrial Revolution when factories began operating around the clock to maximize productivity. As industries evolved, the need for a workforce available at all hours grew, leading to the widespread adoption of night and rotating shifts. However, this round-the-clock work schedule has significant implications for sleep and health. Studies show that shift workers often experience disrupted circadian rhythms, which can lead to a range of sleep issues, including insomnia and excessive daytime sleepiness. The challenges of adapting to non-traditional hours can result in long-term consequences, impacting both physical health and mental well-being. Understanding the biology of sleep and the history and ramifications of shift work in the hospital environment is crucial as Respiratory Therapists continue to navigate the demands of a 24/7 workplace. This talk will begin with an overview of the normal biology of human sleep, drawing on information from the American Academy of Sleep Medicine. We will also explore common sleep disorders, including definitions of insomnia, shift work disorder, sleep apnea, and parasomnias. The goal is to provide the audience with a better understanding of sleep-related issues in general. The main body of the discussion around shift work and treatment is sourced from the references I have noted. This is not a study but a general review of the current information on shift work and its effects on our

membership. Understanding the effects of shift work is crucial for maximizing the health and wellness of respiratory therapists (RTs) in Canada. While there are resources available for other first responders, similar support tailored to our population may be lacking. Do managers and administrative staff possess a fundamental understanding of sleep and its importance? Is there a system in place to assess chronic fatigue in those suffering from shift work disorder? Furthermore, are the resources available in Canada for insomnia and shift-related sleep issues easily accessible? Addressing these questions is vital for ensuring the well-being of RTs.

SATURDAY, MAY 10, 2025

BREATHING NEW MEANING INTO EVIDENCE EVIDENCE-BASED PRACTICE: SCIENCE, STORIES, AND SOLUTIONS

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Evidence-based practice (EBP) has been a cornerstone of clinical decision-making for over three decades, celebrated as the gold standard for improving patient outcomes. The underlying principle is that integrating scientific evidence into practice enhances care and yields better patient outcomes. However, despite its widespread appeal, the EBP movement has faced critiques and challenges. These debates have revolved around its definition, practical implementation, methods of teaching, and how to ensure that graduates are prepared to effectively implement its principles in real-world practice. Key points of contention include the nature of scientific evidence, the role of clinical experience, concepts of validity, the importance of context in decision-making, and the integration of patient-centered knowledge. As one of the most researched fields in modern healthcare, EBP continues to evolve and shape professions such as medicine, nursing, and rehabilitation, including respiratory therapy. This presentation aims to offer an overview of the major advancements in EBP over its 30-year history. It will explore both successes and challenges encountered along the way and consider how these lessons can be harnessed to move the field forward ensuring professionals can deliver high-quality care that aligns with the principles of the quintuple aim—enhancing patient experience, improving population health, reducing costs, fostering provider well-being, and advancing health equity in a complex. The speaker will explore how emerging fields, like respiratory therapy, can effectively address these challenges, particularly in the context of rapidly changing healthcare landscapes. By adapting to new evidence-based practices and leveraging their specialized knowledge, respiratory therapists can play a pivotal role in improving patient outcomes while maintaining the unique, context-sensitive aspects of their profession.

FINDING LIFE IN LEARNING: EVALUATION OF A CURRICULAR REDESIGN TO SUPPORT THE COMPLEX CARE

PATIENT USING THE CONTEXT-INPUT-PROCESS-PRODUCT (CIPP) MODEL OF PROGRAM EVALUATION

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Background: Program accreditation sets quality benchmarks, ensuring Respiratory Therapy program graduates are prepared to challenge the national credentialing exam and meet provincial regulatory standards for entering the workforce. Respiratory therapy program curricula, like other medical education programs, are complex and must meet accreditation standards while deployed in unique local and regional contexts. The Context-Input-Process-Product (CIPP) model of program evaluation is a holistic, collaborative, decision-oriented model that promotes meaningful program change toward closing identified gaps and improving educational value in complex context-dependent curricula. Program gaps in student preparedness for management of complex patients were previously identified. Using the CIPP model, this presentation describes the redesign of program curricula at Conestoga College and the emergence of a novel clinical rotation known locally as, “The Freeport rotation”. Successes, challenges, and limitations will be shared. As the CIPP model may be broadly applied, it is the hope of these presenters that others may appreciate the model for their own local use.

Methods: Unlike outcome-only focused evaluation methods, the CIPP model demands input and analysis at each of the four steps. A formative evaluation stance was adopted to align with the goal toward curricular improvement. Regional contexts were considered when accreditation standards were applied. Data captured for each step came from multiple sources including existing program meetings, program performance results, stakeholder surveys, rotational evaluations, and accreditation documents. Both quantitative and qualitative data were collected.

Results: Context evaluation identified rotational inconsistencies, competing educational goals, and patient acuity as barriers within the existing model. The ‘living classroom’ was identified as a novel approach to augment experiential learning. The need for patient partner engagement was recognized as an absent stakeholder in the current educational model. A local institution, known as Freeport, with patients who have tracheostomy tubes requiring complex care, was identified. A goal to create a clinical rotation at Freeport was established to address these needs and deploy these approaches. Input evaluation determined the rotational length. Learning outcomes and procedures of the Freeport rotation were developed. Curricular restructuring was done longitudinally to realign curricula to prepare students for the new Freeport rotation. A local subject matter expert was identified and hired to facilitate learning within the rotation. Process evaluation included modifications to competency tracking. Patient engagement parameters were established. Budgets were considered. Product (outcome) evaluation showed improved student performance and comfort both technically and socially in working with pa-

tients with complex needs from multiple stakeholder perspectives. Accreditation processes endorsed the approach.

Discussion: The CIPP model of program evaluation extends to context and process as well as outcomes. This creates the potential for deeper program change through thoughtful and informed decision-making. Success of deployment is dependent on robust stakeholder engagement. Moreover, success of this model depends on both positive internal workplace culture relationships, and external institutional relationships. Limitations on success of this model may include funding, access to patient care environments, process infrastructure, and available human resources.

Conclusion: The Context-Input-Process-Product (CIPP) model of program evaluation is a holistic, collaborative, decision-oriented model that promotes meaningful program change toward closing identified gaps and improving educational value in complex context-dependent curricula. Our local application of the CIPP model has enabled transformative changes for respiratory therapy students, both technically and socially, when working with patients with complex needs.

CASE STUDY: AWAKE TRACHEOSTOMY IN A PREGNANT PATIENT WITH SEVERE BRONCHOPULMONARY DYSPLASIA AND DIFFICULT AIRWAY FOR CESAREAN SECTION

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Introduction/Background: Difficult airway management is a cornerstone of the practice of Anesthesiology. The Canadian Airway Focus Group defines a difficult airway as problems with any or all of face mask ventilation, laryngoscopy, insertion of supraglottic airway devices, tracheal intubation and front-of-neck access(1). Bedside observations including reduced mouth opening, short thyromental distance and high Mallampati score can indicate a potentially difficult airway. Pregnant patients have unique physiologic changes that can make airway management more challenging including upper airway edema (2), increased aspiration risk due to reduced lower esophageal sphincter tone and increased intraabdominal pressure from the enlarged uterus, an accelerated onset of desaturation following apnea due to decreased FRC and increased oxygen requirements, and impeded laryngoscope blade handling by enlarged breasts. We present the case of a known difficult airway in a high risk pregnant patient.

Clinical case: Our patient is a 39 year-old pregnant female with mixed obstructive/restrictive pulmonary disease secondary to congenital bronchopulmonary dysplasia, as well as upper airway restriction secondary to a large cystic hygroma of the neck. There was historical evidence of difficult airway with a reported Grade 4 view with video laryngoscopy during a prior procedure. She had previously required multiple tracheostomies with prolonged ventilation weaning, including once for perioperative acute airway obstruction. Additionally, recent nasopharyngoscopy was unable to visualize any of the larynx due to near complete obstruction by the neck mass. A multidisciplinary meeting

with representation from Obstetrics, Anesthesiology, Respiriology, Otolaryngology, and others determined that elective placement of a tracheostomy followed by delivery via Caesarian section at 28 weeks gestation was the safest way to prevent worsening respiratory distress and the risk of sudden respiratory failure with each progressive week of pregnancy. The patient was admitted to the high acuity unit at 23 weeks, 3 days gestation with increasing oxygen requirements, requiring 4L of oxygen at rest to maintain saturations close to 95%. She underwent an uncomplicated awake tracheostomy at 25 weeks, 6 days weeks gestation. She then underwent an scheduled Caesarian section at 28 weeks gestation under spinal anesthesia. The day after surgery, she developed hypercarbic respiratory failure and required emergent ventilation via the tracheostomy. After a course of IV antibiotics for pneumonia, she was weaned from the ventilator and eventually decannulated on post-operative day 15. She was discharged from hospital on POD20 on 4 L/min of home oxygen.

Clinical Lesson/Conclusion: The possibility of emergency airway management in an obstetric patient always exists. A review of anticipated difficult obstetrical airways found that only 66% of planned Caesarian sections were carried out at the specified time, while the remaining 33% required emergency surgery. 4 Emergency surgery frequently occurs after hours when equipment and personnel are likely to be limited and significant time constraints predispose one to error. As part of the multidisciplinary team, we were able to advocate early for elective tracheostomy as a key component of the birth plan and allowed the patient to be actively involved in decision- making.

THE END OF AN ERA – PEDIATRIC OSCILLATION BEYOND 2026

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Background: Pediatric high-frequency oscillatory ventilation (HFOV) as a rescue ventilation mode remains very common across North America despite pediatric guidelines neither for nor against the therapy (1). The primary device employed in PICUs remains the Sensormedic 3100 oscillator, which will no longer be supported in Canada in early 2026. While various other neonatal oscillators exist, their performance varies (2), and questions remain about what the best path forward is for many pediatric centres that currently offer HFOV.

Methods: The panel will discuss three projects undertaken to help inform options moving forward. First, a retrospective review of our oscillator usage at SickKids was conducted to quantify the usage and patients for whom oscillation was offered. We collected demographics and the primary reasons for HFOV, including which HFOV device was used; ventilation approaches pre-transition and initial HFOV settings; pre-and post-HFOV oxygenation index; and outcomes such as ECLS and survival. Second, a bench study was conducted using currently available Health Canada-approved HFOV devices, including variations in circuits that

are compatible with the respective devices. The ASL5000 was used to simulate various FRC, compliance, and resistances (of the respiratory system) encountered in pediatric practice, representing various term infants up to older toddlers within the range of size that devices can support. Third, provincially, pediatric sites have begun working together to quantify the critical care system impacts should sites lose the ability to offer HFOV, which includes potentially greater resource utilization for ECLS transport services, for example, or transfers to sites offering HFOV. The sites have also started preliminary work to develop capacity for supply sharing of circuits (under the setting of limited resources) and ways to share currently available resources within the province.

Results: Seventy-seven (77) patients who received HFO were identified between July 2020 and June 2023. Forty-eight (48) patients who received HFO were under 5kg, using the Servo N or 3100. The remaining 29 patients in this data set were over 5kg, 93% (27/29) of whom exclusively received the 3100 for HFO. Overall, 67% (62/93) of patients who received HFO survived to successful extubation. This value is higher for patients diagnosed with CDH (78%, 25/32) than those without (61%, 37/61). Ten patients were placed on ECMO after HFO; five of these patients survived. Four HFOV devices were tested in the bench study, with tidal volume delivery highly varied between given devices with the same settings and limited at approximately 30mL or lower across neonatal devices under the tested conditions (which roughly represents what volumes would be needed for a 10kg pediatric patient). Circuits altered the performance significantly under the same conditions. A provincial working group has met three times to date, starting with a province-wide system for sharing equipment and resources related to oscillation. Both understanding the current practice landscape and existing site capacities, opportunities for minimizing devices when in excess, sharing of consumables as they become less available, and plans beyond are beginning.

Conclusion: Oscillation remains an integral part of life support for patients failing conventional ventilation in Ontario. Work is ongoing to find ways to mitigate the impact of the loss of the Sensormedics oscillation device.

BUILDING CULTURAL COMPETENCY IN RESPIRATORY THERAPY EDUCATION: THE POWER OF SIMULATION

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Background/Introduction: Marginalized individuals frequently experience health disparities due to a lack of intercultural understanding between healthcare workers and patients (Marja & Suvi, 2021; Morell et al., 2002; Mutch et al., 2024; Shirazi et al., 2020; Walshe et al., 2022). This highlights the necessity for cultural competency (CC) education in healthcare to ensure culturally congruent care for patients, regardless of their identity and cultural background. While simulation pedagogy has been shown to enhance CC in nursing and medical students (Bahreman et al., 2016; Byrne, 2020; Markey et al., 2021), limited research exists on

its impact within respiratory therapy education. This study seeks to address this gap by investigating the potential for diverse standardized patient simulations, combined with a formal educational session, to enhance cultural humility in respiratory therapy students.

Methods: This study involves first year respiratory therapy students participating in simulations featuring diverse standardized patients. Students will also attend a formal educational session provided by the college's Equity, Diversity, and Inclusion (EDI) committee. Pre- and postsimulation surveys will be administered to assess students' levels of cultural humility and awareness of the importance of CC. The data will be analyzed to determine whether their cultural competency was enhanced following the intervention.

Results: The expected outcome is an increase in cultural humility and awareness among student respiratory therapists following their participation in the simulations and EDI session. Data from the pre- and post-surveys will be compared to assess the extent of any improvement in students' cultural competency.

Discussion: The study aims to explore whether incorporating diverse standardized patients into simulation, alongside didactic learning, can effectively enhance cultural competency in respiratory therapy students. This approach may provide students with the intercultural understanding necessary to address the health disparities faced by marginalized populations.

Conclusion: Through the use of diverse standardized patients and an EDI educational session, this study aims to equip respiratory therapy students with the skills needed to deliver culturally congruent care. If successful, this approach could be adopted more widely in respiratory therapy education, ultimately improving healthcare outcomes for marginalized individuals.

CASE OF HYPERTENSIVE CRISIS UNDER ANESTHESIA: DIAGNOSIS, MANAGEMENT, AND LESSONS LEARNED

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Hypertensive crisis under anesthesia poses a significant risk of perioperative morbidity and mortality. This risk becomes particularly concerning in cases of sustained, severe hypertension that does not respond to antihypertensives or vasodilatory anesthetics, raising suspicion for uncommon entities such as pheochromocytoma. We present the case of a fifty-year-old male who developed a hypertensive crisis during elective general surgery. We discuss our approach to managing hemodynamics throughout the 12-hour procedure and the postoperative course. This case highlights the importance of vigilance, critical thinking, and the role of the anesthesia team. Through this case, we explore pheochromocytoma tumours, their clinical behaviour, and patient management. Finally, we outline a practical approach to managing hemodynamic instability, a commonly encountered challenge during the operative period.

DECIDE-TRACHEOSTOMY PARTNER AND FAMILY ENGAGEMENT IS CRITICAL FOR MEANINGFUL CHANGES

IN CARE FOR CHILDREN WITH MEDICAL COMPLEXITIES AND THEIR FAMILIES

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Background: Children with medical complexities requiring tracheostomy with or without long-term ventilation comprise over 60% of the children in Alberta who stay in hospital more than 180 consecutive calendar days. This extended stay not only disrupts the child's home life but places additional emotional, psychological and financial burden on their families, especially if the specialty services they require are not available in their home community. Additionally, the associated investment from the healthcare system is high, estimated \$484,660/child/year, with a 22% mortality rate and 28% unable to be discharged home. Healthcare administrators cannot solve this problem alone; partnerships between administrators, frontline healthcare providers (HCPs), and patients/families with lived experience are necessary to make meaningful impact. The aim of this project is to engage families, HCPs, and hospital administrators to codevelop a standardized care path to decrease length of stay by 40%.

Methods: To address this concern, 3 years of consultation work via evidence reviews, family focus groups, and HCP surveys were conducted to understand the challenges faced by families and HCPs to support the child's journey towards home after tracheostomy. This provided the context for an implementation/evaluation project to create a standardized provincial care path to guide the child's entire hospital journey from how HCPs approach families regarding the decision for tracheostomy and set expectations of their child's outcome through to discharge home and reintegration into their community. Provincial working groups were comprised of multidisciplinary HCPs from diverse professions and subspecialties, health system administrators, and at least one family advisor with lived experience in each group.

Results: The first provincial working group aimed at developing a provincial algorithm to ensure a unified message from HCPs on the multidisciplinary team and resources to facilitate the family discussion and ensure they are truly informed of the potential impact on themselves, their child and their family. While only one family advisor was present at provincial meetings amid a virtual room full of HCPs, the subsequent draft was shared with three family advisors and two HCPs. Their feedback highlighted that the suggested conversational resources to support family understanding and decision-making did not align with families' expectations. The questions were too complex and difficult for families undergoing the mental stress of having a critically ill child to conceptualize, and they did not feel that having those conversations at the time of decision-making would have been a useful resource. Recognizing that these families might have felt empowered to raise these concerns due to their ethnicity and socioeconomic standing, additional

ethnically diverse parents were invited to participate in the provincial working groups. Five parents were invited to participate in provincial working groups. One group aimed at improving family integration into their home communities post-discharge utilized the lived experience of these family advisors to identify outputs not recognized by the multiciliary healthcare team, such as the need for a school integration toolkit and a funding navigator to understand eligibility for and the application process associated with government funding programs.

Conclusion: Engagement and consultation with family partners with lived experience are critical in developing changes aimed at health system improvement. This engagement strategy blends together clinical expertise with lived experience to create meaningful change, valued by patient and family end-users.

WORKSHOP

COMPASSIONATE EXTUBATIONS (CE) AND WITHDRAWAL OF CARE – DISCUSSION AND PRACTICAL SOLUTIONS FOR RESPIRATORY THERAPISTS

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Background/Introduction: End of life care is a challenging aspect of a respiratory therapist's job, with evidence of negative mental health impacts following these situations. However, there are strategies to improve this experience for everyone involved, from the care providers to patients and families.

Methods: This workshop includes the presentation of research and initiatives in end-of-life care and education in British Columbia. Throughout the presentation, participants are encouraged to engage in small group discussion through prompting questions regarding end-of-life care practices and education. A policy and procedure for Compassionate Withdrawal of Life Support is discussed, along with a job aid used to guide managers for checking in with staff after a CE. End-of-life care education is explored, including sharing open access resources for RT students.

Results: Research, personal experiences, and hospital documents will be used to lead discussions on 1) Comfort level and current practice of therapists performing CE 2) What happens after a CE; using a check-in tool, 3) Guideline to improve flow of CE, 4) Family-centred care, 5) Student strategies, 6) Personal experiences and impacts from CE.

Discussion: By engaging in small group discussion and exploring themes with the larger audience, participants can share lived experiences and learn from each other in a supportive environment. Participants will discuss ways to provide a more compassionate, family-centered approach to withdrawing care.

Conclusion: At the end of this session, participants will leave with practical solutions to better approach this difficult aspect of healthcare.

RESILIENCE INTERVENTION AND MENTAL HEALTH MONITORING OF STUDENTS IN CLINICAL PRACTICUM

AT FANSHAWE COLLEGE

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Background: COVID-19 brought to light the mental health issues healthcare workers experience due to their careers. This includes post-traumatic stress, burnout and compassion fatigue. As well as the importance of having mental wellness resources readily available for healthcare workers. While the stigma surrounding mental health concerns often leads to a lack of discussion, this does not alleviate its prevalence. This brings up the importance of protecting the future of respiratory therapy, which is our students. Yet, there are hardly any studies conducted to look into the success of mental health interventions when applied to respiratory therapy students. Our research aims to monitor respiratory therapy student well-being during clinical practicum and assess the use of resilience training as an intervention for those struggling to cope with the compounded stress of their clinical placements.

Methods: The study will involve respiratory therapy students from Fanshawe in their 3rd year, clinical practicum level 3. All students must complete a mandatory knowledge session on how to build resilience and coping strategies. After this session students who choose to participate in our research study will complete a Pre-Intervention Survey. Once students return to their clinical placement, they will be prompted to complete a daily evaluation in CompKeeper of their mental health status. After filling out their evaluation, based on their responses they are ranked into tiers which will either encourage those who are coping to continue on and share their strategies, prompt them to remember specific tools and resources taught to them, or request they use provided help lines and resources for immediate crisis intervention. After the completion of their clinical placement in April, students will fill out a Post-Intervention Survey. Intervention surveys assess their demographics, current mental health status and current coping strategies.

Results: The duration of this study is from November 2024 to April 2025. Thus, the results are still pending. Ideally, we will be able to use the pre- and post-surveys as well as the ongoing mental health check-ins to gauge the success of the intervention. Additionally it may be able to identify which stressors students found most overwhelming.

Discussion: The discussion expands on the current need for assessing clinical practicum students' mental health. The discussion will review our results and how these results can be applied or are applicable to the current curriculum in place. It will further identify strengths and weaknesses in our intervention and study design based on our data results.

Conclusion: Since we anticipate a student heavy audience, we hope these objectives will inform their understanding of resilience tools and prepare them for their clinical placement. For the audience, we hope they take an active interest in this research, if not for their own sake

then for the sake of their workplace community.

ANESTHESIA IN SPACE: ADAPTING TO THE FINAL FRONTIER

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As human space exploration progresses, the need for advanced anesthesia practices will grow in parallel with the increasing risk of injury and medical complications. With long-duration missions, such as NASA's Artemis mission to the Moon and future expeditions to Mars, the duration of travel will raise the likelihood of physical injuries or medical issues requiring anesthesia. The unique challenges of space travel, including microgravity and the environmental conditions of space, require significant adaptation in anesthetic care. This session will address the physiological changes astronauts experience in space, including altered circulatory, respiratory, and metabolic responses, which complicate the delivery of anesthesia. In microgravity, drug pharmacokinetics are disrupted, posing challenges to ensuring safe and effective anesthesia delivery. Additionally, payload restrictions, which limit the weight and space available for medical equipment, further complicate the logistics of anesthesia administration in space. As space missions grow longer, the risks of injury and medical complications will increase, necessitating advanced approaches to anesthesia, including the potential for more widespread use of regional anesthesia techniques. Regional anesthesia, with its lower risk and reduced reliance on systemic drugs, may become a critical component of space medicine, offering a safer alternative to general anesthesia in space. We will also explore how space agencies are adapting training protocols for astronauts to ensure they are equipped to manage anesthesia in space, as well as ongoing efforts to improve anesthesia systems and increase safety during space travel. The session will highlight how innovations in anesthesia delivery, alongside comprehensive astronaut training, can help mitigate risks and ensure astronauts receive the best possible care as they venture into the final frontier.

INPATIENT TRACHEOSTOMY AIRWAY SPEECH AT SICK KIDS – A MULTIDISCIPLINARY APPROACH TO CARE

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Background/Introduction: Pediatric patients requiring tracheotomy placement are some of the most medically complex patients with high rates of co-morbidities (1) and complications (2). Tracheotomized pediatric patients have a higher hospitalization cost per admission when compared to average pediatric admission costs. (3) Our multidisciplinary team has aimed to decrease length of stay, decrease rates of complications, without compromising quality outcomes.

Methods: Interventions included weekly team rounding, bedside safety checks of emergency tracheostomy equipment and signage, caregiver education, bedside RT/RN ed-

ucation. Process measures included adjustments to bedside tracheostomy equipment, Speech Language Pathologist (SLP) consult rates, time to one-way valve (speaking valve) assessment, and complications prevented.

Results: The iTASSK (in-patient Trach, Airway, Speech at Sick Kids) team has increased compliance to hospital bedside emergency tracheostomy equipment finding 91.75% of kits incorrect on admission, 95% of kits remained correctly stocked. The SLP consults for admitted tracheostomy patients has increased to over 93.75% of admitted tracheotomized patients. Assessment for one-way valve is performed weekly on rounds, time to assessment and first trial has decreased. Prevention of complications in the tracheostomized patient including respiratory device associated wounds, false passage, correct and appropriate emergency plan/equipment in place for patient.

Discussion/Conclusion: Multidisciplinary tracheostomy teams such as iTASSK provide caregivers and healthcare providers with expertise in the heterogeneous population of tracheotomized patients throughout the continuum of care. Trach teams decreases length of stay and complications, while improving the confidence caregivers have in caring for their child once discharged.

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FROM THEORY TO PRACTICE: THE ROLE OF AI-POWERED VIRTUAL SIMULATION IN ADVANCING RESPIRATORY THERAPY EDUCATION

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Background: In-person health simulation has long been a vital component of healthcare education. However, its use is constrained by several factors, including high costs, the need for specialized equipment, limited opportunities for interdisciplinary collaboration, and space limitations. These challenges are pronounced in the Respiratory Therapy profession, where historically there has been a lack of high-quality virtual resources tailored to RT-specific training.

Methods: The Virtu-WIL project, led by Colleges and Institutes Canada in partnership with Simulation Canada and funded by the Government of Canada, addresses these limitations through the development of virtual simulations to enhance healthcare education. The presenter will share their contributions to the Virtu-WIL project, focusing on

the creation of an AI-integrated simulation designed to improve learner interactions with both patients and healthcare teams. The presenter will discuss their pilot research study, which aims to investigate the use of generative AI tools in healthcare simulation education and their effects on student communication with the patient care team and resource allocation.

Results: Attendees will gain valuable insights into the development of AI-powered virtual simulations tailored to Respiratory Therapy training.

Discussion: The presenter will showcase the development process, learner outcomes and details of the pilot research study.

Conclusion: By the end of the presentation, attendees will understand both the process and the outcomes of creating AI-driven virtual simulations for the Respiratory Therapy profession, and the potential of this innovative approach to enhance healthcare education.

TAKING CARE OF BIS-NESS: MAKING THE MOST OF INTRAOPERATIVE EEG MONITORING

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Intraoperative electroencephalographic (EEG) monitoring provides valuable insights into anesthetic depth, yet its interpretation remains underutilized in clinical practice. This session will explore the EEG correlates of anesthetic states, detailing how various anesthetic agents modulate brain activity and how these changes manifest in EEG waveforms. Key patterns such as alpha dominance, beta arousal, and burst suppression will be discussed in the context of anesthetic depth and patient outcomes. It will also examine the clinical benefits of processed EEG monitoring, particularly its role in optimizing anesthetic titration, potentially reducing the incidence of intraoperative awareness and post-operative cognitive dysfunction. While Bispectral Index (BIS) is the most widely recognized processed EEG tool, its limitations will be critically evaluated. Finally, this session will demystify the interpretation of intraoperative EEG monitoring, equipping clinicians with practical strategies to integrate EEG-derived data into anesthetic management. Attendees will learn to distinguish between artifacts and meaningful EEG trends, use real-time data to refine anesthetic dosing, and apply this knowledge to enhance patient safety. By the end of this talk, participants will move beyond the use of basic unidimensional BIS values to a more nuanced understanding of anesthetic neurophysiology, allowing further personalization of anesthetic care.

PARADIGM SHIFT IN NEONATAL RESPIRATORY SUPPORT: IS IT TIME TO USE NIPPV IN THE COMMUNITY?

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Background: Non-invasive respiratory support is an established therapy for neonates experiencing respiratory distress and for management after surfactant administration. Community NICUs have recently been expanding their ca-

capacity due to increased funding or constraints on bed space, thereby enhancing local care levels. This expansion necessitates the provision of care for patients with higher acuity and the exploration of additional therapeutic modes, which in turn requires training and education. Previously, if available, NIPPV was utilized as an escalation mode, mainly serving as a bridge for transport. However, emerging evidence advocates for the use of NIPPV not only as an escalation mode but also as a primary mode of therapy and as a supportive measure for neonates after extubation.

Methods: The current literature will be examined and condensed into a summary. Evidence-based recommendations and best practices will be identified and encapsulated. Case studies will be analyzed and shared with the audience to maintain engagement and participation.

Results: NIPPV likely reduces the rate of respiratory failure and need for re-intubation compared with early NCPAP. NIPPV may reduce the risk of developing bronchopulmonary dysplasia and chronic lung disease. NIPPV may be employed as a primary mode. With adequate training and education, NIPPV can be used safely and effectively in the community setting.

Discussion: The use of nasal intermittent positive pressure ventilation (NIPPV) as respiratory support for preterm infants is well established in tertiary NICU. Current literature and evidence from randomized trials indicates that NIPPV may be advantageous over continuous positive airway pressure (CPAP) as post-extubation support. However, randomized data comparing NIPPV with CPAP as primary support, and for the treatment of apnea, are conflicting. Emerging evidence encourages the use of NIPPV in the community. Its advantages, limitations and methodology of use will be discussed.

Conclusion: Nasal intermittent positive pressure ventilation (NIPPV) may be more effective than nasal continuous positive airway pressure (NCPAP) in certain situations. NIPPV reduces the incidence of extubation failure and the need for reintubation more effectively than NCPAP in preterm infants. Furthermore, current evidence-based practices employed effectively in tertiary NICUs could also be advantageous and applicable in community settings, provided there is sufficient education and training.

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SUPPLEMENTARY MATERIALS

Figure 1: Placeholder

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