



CANADIAN SOCIETY OF RESPIRATORY THERAPISTS  
SOCIÉTÉ CANADIENNE DES THÉRAPEUTES RESPIRATOIRES

## Proceedings from the Canadian Society of Respiratory Therapists Annual Education Conference

May 24–26, 2018 • Vancouver, British Columbia

We are pleased to present a select number of abstracts from the proceedings of the CSRT Annual Education Conference to be held in Vancouver, British Columbia, on May 24–26. This conference will include topics delivered by international, national, and regional individuals with expertise in various areas of respiratory therapy practice, including quality assurance, patient safety, evidence-based practice, patient and family-centered care, research, and innovation. As evidenced by the following abstracts, the work of our colleagues in 2018 highlights current research and practice innovations led by respiratory therapists. 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 <https://conference.csrt.com/>).

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 Please note these abstracts have not been peer reviewed.

### PLENARY SESSION

#### 01 IMPACT OF TOBACCO, ALCOHOL AND OTHER DRUGS ON CARDIOPULMONARY HEALTH

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**BACKGROUND:** There is currently a dearth of comparable, valid data on the harms and economic burden of substance use (SU) in Canada. The most comprehensive assessment was developed using data from 2002. Building upon the success of the previous cost study based on 2002 data, the methods and findings of updated direct healthcare harm (morbidity and mortality) and cost estimates will be presented. This study undertaken jointly by the Centre for Addictions Research of BC and the Canadian Centre on Substance Use and Addiction will examine morbidity, mortality and economic costs attributable to SU in Canada during 2006–2016.

**METHODS:** Over 100 health conditions have been identified to be causally wholly or partially attributable to SU. Morbidity and mortality of partially attributable conditions will be estimated by attributable fraction methodology, which will be discussed. Number of deaths, hospital days and diagnoses in acute care hospitals, psychiatric separations and hospital days in psychiatric hospitals, admissions in inpatient and outpatient centres, and days in treatment related to SU will be discussed. Additionally, the cost of these harms will be estimated. Data sources and analysis methods will be presented.

**RESULTS:** The presentation of results will focus on cardiopulmonary and other conditions relevant to respiratory therapists. Health conditions presented will include malignant neoplasms, cardiovascular diseases, respiratory diseases, infectious diseases, injuries, and poisonings.

**DISCUSSION:** In 2002 it was estimated that 19.3% of mortality and 17.8% of hospital days were attributable to SU. Additionally, the economic cost of substance use in Canada was estimated to be almost \$40 billion. Our updated findings will provide more recent estimates and trends that will be used to assess the burden of SU and inform policy.

### STUDENTS' FORUM

#### 02 LEARNER TO LEADER: NAVIGATING THE TRANSITION TO PRECEPTOR

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Respiratory Therapists (RT) often find themselves transitioning from student, to practicing Registered Respiratory Therapist (RRT), to preceptor over the span of only a few weeks. RRTs are expected to precept and mentor learners at a time when they, themselves are still developing routines, refining skills and establishing their professional identities as independent healthcare professionals. Currently, there are little to no processes in place to prepare the inexperienced RRT to take on the role



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of clinical preceptor. This transition from student to preceptor has been investigated and is well supported for other professionals, but there currently exists a gap in the field of respiratory therapy.

Research in education suggests a strong connection between teacher quality and successful student outcomes. It is therefore important to identify the elements that produce high-quality preceptors in order to identify strategies to ensure student success. We will discuss the data collected from surveying 50 recent graduates and new preceptors as well as 50 experienced RRTs, focusing on the qualities imperative to clinical precepting and the challenges faced during this transition. In this presentation, we aim to illustrate common themes identified surrounding these challenges as well as locate gaps in preparation for this new role. Additionally, we will explore strategies to better prepare students for preceptorship using models successfully implemented in other professions as well as methods currently in use by clinical RRT preceptors.

### 03 MENTAL HEALTH IN THE CLASSROOM: A STUDENT PERSPECTIVE

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Maslow's Hierarchy of Needs states that physiological needs are the basis of human motivation and must be attained before the top-tiered self-actualizing needs are attempted. In a student with a mental health illness however, the items contained within each tier of the pyramid become dramatically skewed when compared to their peers. Importance falls on keeping up with studies, committing to the expectations regarding extracurricular events, all while bearing the boulder of financial responsibility that comes with being a university student. During their academic career, students may be in different points of mental health. Some may have come into university with a full diagnosis, treatment regime, and support system in place before they ever step foot in a classroom, but others may have it develop during their school years largely unchecked, resulting in increasingly destructive behaviours and dangerous impulsivity traits. Students should understand that while they are learning and growing under the guidance of an academic faculty and have a responsibility to the community that they have pledged their careers to; they have a responsibility to themselves first. Surrounding mental health is a stigma based on misunderstanding and lack of knowledge, but students should understand that supports and resources are available to help them succeed in the classroom and reach their academic goals. Student counselling, group therapies, test/exam accommodations, and classroom lecture support services are available to cross the barriers that their mental health poses at school and how to manage their integration with extracurriculars. Addressing difficult areas such as: What if I can't do [this]? How am I going to approach difficult clinical experiences? What if I'm having a hard time managing my condition while in school? While schools must still abide by their provincial accessibility laws, students should know that they can develop their own innovative support resources that will help them to participate in their studies and how to go about implementing them into the classroom. Learning this serves as a strong foundation to build confidence, determination, and success once the lessons in classroom come to an end, and the lessons in the career field begin.

### 04 SRT TO COMMUNITY RT

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This presentation will be geared towards current respiratory therapy students. As we pass the torch to the young generation, this will introduce them to the role of an RT in the community. As students are trained nationally, for the most part, on how to work in acute settings, students

end up wanting to work there when they graduate since that is what they got exposed to; i.e., their new comfort zone. If we start changing this mindset we will be able to be pioneers and take our profession to the next level and serve the perpetually changing Canadian demographic. With the changing landscape of the health care system and the needs of different communities, our role as respiratory therapists will continue to evolve as there is a need in primary care to provide client-centered care.

This presentation will start with a brief description of the transition from hospital model to community model. Then different roles RTs currently play in the community will be described. I will be speaking from personal experience on how I transitioned from being a student to choosing to work as a community RT. Barriers faced, challenges in the new environment, strategies and skillset to develop will also be discussed. For example, attending the CSRT conference as a student expanded my horizon of what I envisioned as the limitless opportunities of our profession.

### 05 A LETTER TO THE PRACTITIONERS: SINCERELY, THE PATIENT

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One of the most noble and popular reasons healthcare workers enter their professions is to help the sick and dying. The origins of medicine can be attributed to this goal; however, modern medicine can now be described more accurately as disease-specific diagnostics and therapeutics. It is very easy to lose sight of the individual under all of the patient data, regulations, strict guidelines, and most of all the stress of shift work and disrupted circadian rhythms. Although the goal of the healthcare worker is to make the patient better, one must keep in mind that the patient may bear more stress due to their helplessness. It is imperative that we see patients as individuals rather than a list of symptoms on a chart. A crucial part of making the patient feel valid is effective communication. Oftentimes patients feel stressed, anxious, and helpless during their hospital visit and inadequate communication can add to this anxiety. Therefore, good communication is used as an invaluable tool in producing therapeutic effects through comfort. In addition, the manner in which a healthcare worker communicates is as important as what is being communicated. It also plays a vital role in gaining information from the patient as well as providing legal documentation such as informed consent.

Communication cannot be described as one-dimensional as it extends beyond words. Vocal tones, body language, openness, sincerity, and even concealment affect communication and makes up what we call bedside manner. A healthcare professional may run into countless obstacles when practicing effective communication; however, caring for a patient involves treating the entire individual, which includes the patient's mental well-being. As the patient meets with the practitioner, it's almost as if they enter into a partnership, a marriage if you will. Like any relationship, it will take trust, reliance and mutual respect for it to work, and patient-practitioner dynamic is no different. However, the differences start to settle in when boundaries must be set because after all, it is both a personal and a professional relationship. The line between caring verses objectivity must be trodden lightly. A common phenomenon that takes place between the patient and practitioner is known as transference and counter-transference. Abiding to set boundaries will aid to minimize these experiences.

Another point to take into consideration is the patient's perspectives of the healthcare worker. The practitioner may be viewed as superior due to reasons like the use of medical jargon and authority that may put them in a position of superiority. This relationship can be further complicated by a patient's inability to help their situation leaving them depended on the healthcare worker and feeling helpless. It's critical that the practitioner be aware that these feelings may exist and try to limit any feelings of inferiority by establishing a rapport via good communication. Feelings of helplessness can be limited by empowering the patient to be more

involved in their care using techniques like shared decision-making, taking into consideration the patient's treatment goals.

## 06

### ADMINISTRATION OF SUPPLEMENTAL OXYGEN IN CARDIAC PATIENTS

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**BACKGROUND:** Oxygen is a widely available therapeutic agent that has become routinely administered to patients admitted with hypoxemia and commonly to cardiac patients. The use of supplemental oxygen is meant to correct hypoxemia and to prevent or decrease cardiopulmonary workload. However, as oxygen concentrations reach nonphysiologically hyperoxic levels, the detrimental effects of oxygen may be overlooked to ensure adequate oxygenation of patients.

**OBJECTIVE:** This paper aims to determine whether the risks of supplemental oxygen overshadow its benefits in patients presenting with cardiovascular disease.

**METHODS:** An investigation of current literature was done addressing the effects of hyperoxygenation in cardiac patients with consideration of the effects on mortality.

**RESULTS:** Multiple studies show that there is an association with supplemental oxygen in patients with cardiovascular disease or are post resuscitation and its effect on mortality.

**CONCLUSIONS:** Supplemental oxygen has clear benefits for hypoxic non-cardiac patients; however, there is evidence that there are multiple risks involved in the use of supplemental oxygen in cardiac patients. More clinical trials are needed to quantify the risks and to formulate clear recommendations, but the use of supplemental oxygen continue to be judicious in nature.

## 07

### POST-INTENSIVE CARE SYNDROME: RISK FACTORS AND TREATMENT METHODS

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**INTRODUCTION:** As more individuals survive their critical illness, there has been a rise in concern for their mental well-being following discharge from the Intensive Care Unit (ICU). Post-Intensive Care Syndrome (PICS) is a mental health disorder that encompasses symptoms of anxiety, depression, and post-traumatic stress disorder. PICS and related mood disturbances have shown to prevail in up to 55% of patients one-year post-discharge. Because of this, patients also presented with significant signs of cognitive decline and reduced quality of life.

**DISCUSSION:** The purpose of this presentation is to first develop an understanding of what PICS is before reviewing the sources in the ICU that place patients at the highest risk for development of PICS. Through a series of peer-reviewed articles, the most relevant risk factors proved to be the use of prolonged sedation and prolonged mechanical ventilation. How these personally affect the patient, their ability to form memories as well communicate their needs to staff is reviewed before a patient's perspective on their ICU stay is discussed to create a foundation for methods used to mitigate this rising issue. Both patient testimonies regarding sedation and the care they received from staff are brought to attention as well as the debilitating effects that were caused by the presence of the endotracheal tube. Both methods of non-pharmacologic interventions such as the use of ICU diaries and 24-hour psychologic support are discussed. While ICU diaries are found to be of use in psychological follow-up programs, psychological support during their stay was found to reduce PICS by 50%. Pharmacologic agents including Dexmedetomidine and IV Ketamine are then brought to attention. Dexmedetomidine as a

replacement for other Benzodiazepines has proven to be of benefit in high risk patients, allowing them to remain more aware of their surroundings. IV Ketamine at a sub-anesthetic dose provides a treatment method for otherwise treatment refractory depression and post-traumatic stress.

**CONCLUSION:** Respiratory therapists, among other health care providers, share a key role in a patient's day-to-day care plan during their ICU admission. With increasing awareness of the strain caused by the ICU and the psychological deficits that occur as a result, it is vital that RTs are aware of the consequences and what contributes to its development. Methods of daily practice that can easily be incorporated, such as speaking to your patient, can easily change a patient's outcome and perspective of their ICU stay. RTs are a key factor in allowing for early extubation, which has proven itself to be one of the most substantial factors to minimizing PICS. Not only will reduced rates of PICS reduce re-admission rates and lower hospital spending, it will overall improve patient quality of life once they have been rehabilitated back into the community.

## 08

### PALLIATIVE / END-OF-LIFE CARE: VITAL TO THE RT CURRICULUM

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Respiratory therapists spend the majority of their time throughout a shift in the ICU at a critically ill patient's bedside, in direct communication with the patient and their family. These patients are often ventilated and may die in hospital. It is not uncommon for RTs to experience the death of a patient during their shifts; however, research shows that the majority of RTs are uncomfortable dealing with patient death, withdrawal of life support, or seeking guidance after the fact. The purpose of this presentation is to demonstrate how effective palliative/end of life care education can be for SRTs preparing for their clinical year. This presentation will aim to discuss the benefits of this type of education for SRTs through student, educator and RT testimonies as well as analysis of previous research studies. Another goal of this presentation is to describe what an ideal course on this topic would consist of, according to educators and SRTs. This presentation will inform educators how valuable a course on this subject can be for their students short-term as they transition to their clinical placement, as well as long-term in their future careers as RTs.

## 09

### CEREBRAL OXYGENATION MONITORING

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Traumatic brain injury (TBI) is the leading cause of morbidity and mortality in people less than 45 years old, worldwide. TBI can be divided into two injury phases: the primary injury phase, occurring at the point of impact, and; the secondary injury phase, occurring for an extended period of time post-initial insult. The secondary injury phase may be treatable, and various methods of cerebral oxygenation monitoring give us insight into what is occurring within the brain during this crucial time. This presentation is meant to provide an overview of current cerebral oxygenation monitoring technologies—how they work, as well as their current strengths and limitations. Jugular bulb oximetry (SjO<sub>2</sub>) is the current gold standard for cerebral oxygenation monitoring and gives us a measure of global brain oxygenation. However, it falls short in detecting areas of focal ischemia. Brain tissue oxygen tension (PbtO<sub>2</sub>) can provide a more focal measurement, but this is highly dependent on correct probe placement, which itself is invasive. Lastly, cerebral oximetry is a non-invasive, continuous monitoring option but is limited by the shallow depth it is able to penetrate. This leaves large areas of the brain unmonitored. By understanding what these monitoring options can and can't tell us, we are better able to treat and manage the outcomes of various interventions in our challenging TBI patients.

## 10 RÉSUMÉ WRITING AND INTERVIEW SKILLS

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This presentation will provide the knowledge, tools, and techniques needed to develop a relevant résumé for respiratory therapy professionals in a healthcare setting, and to successfully prepare for the interview process. The presentation will provide the learner with résumé writing skills that will allow the applicants to stand out to future employers. Differences between a résumé and a CV will be explained and résumé template examples will be used to highlight résumés that are able to successfully provide the employer with a succinct summary of the applicant's skills and experiences. Interview styles will be discussed with a focus on preparing for a behavioral interview.

Techniques to prepare for an interview will be based on the STAR (situation, task, action, response) technique that allows the applicant to systematically prepare for a question by providing a template to form an answer. Opportunity to practice the techniques will be provided during short, interactive breakout sessions that will allow partners or small groups to formulate an answer using the learned techniques. Volunteers will be asked to share their answers, to which areas of improvement will be reviewed with the group. A summary of take-aways and a question and answer period will be incorporated.

Often, applying for a respiratory therapy position during their clinical year is the first time many students will have encountered a robust application and interview process. This presentation will prepare students for the hiring process and increase their confidence during an interview.

### EDUCATORS' FORUM

## 11 INCORPORATING APTITUDE TESTING INTO RT STUDENT SELECTION

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The current process of student selection for respiratory therapy programs across Canada is highly varied. The use of a valid aptitude test to add to the robustness of the student selection information may improve student success in the programs, as well as job retention and satisfaction post-graduation. This talk will examine the current state of selection as well as what is being done with aptitude testing in other fields, while presenting a possible model for the RT student selection process going forward.

## 12 INCORPORATING RESEARCH INTO THE RT CURRICULUM

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There are significant gaps between what we know (best available evidence) and what we do (clinical practice). Evidence-based decision-making (EBDM) is the process respiratory therapists and other healthcare providers use to identify and appraise potential evidence and supports the integration of best research evidence with clinical expertise and patient values. Competence in this process is essential to delivery of optimal care.

Evidence-based decision making is an entry level competency for today's graduate Respiratory Therapist (RT). It is important that RTs are capable of finding and critically appraising high-quality research studies, and integrating evidence into their practices. Additionally, the entry to practice RT should be equipped with an understanding of the fundamental processes and practices for conducting clinical research, as well as the ability to contribute to interprofessional teams conducting rigorous research into the effectiveness of the respiratory care they provide.

Fundamental research knowledge, skills and attitudes should be an important facet of all respiratory therapy curricula. This session will describe how research can be incorporated into a respiratory therapy curriculum, beginning with a first-year foundations course and culminating with a third year EBDM project. Opportunities also exist for degree programs to further explore and enhance the student research experience with the development of advanced courses and specialty practice.

A novel specialty practice in clinical research was developed for a fourth-year student, which involves theoretical, contextual and clinical learning. A senior student and new neonatal/pediatric respiratory therapist will share his experiences in a clinical research specialty practice.

## 13 DESIGNING AN INTERPROFESSIONAL CLINICALLY IMMERSIVE SIMULATION

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This presentation will describe a learning opportunity for student respiratory therapists (SRTs) to participate in an advanced interprofessional clinical education and immersive simulation with primary care paramedic (PCP) students. Students will exercise a high level of professionalism through 1) the demonstration of advanced communication by effectively delivering a client handover or transition in care from one provider to another; 2) identifying role clarity with the inter-professional health care team when providing high acuity care to patients; and 3) demonstrating team/system effectiveness in safely transferring a critically ill patient. The clinical immersive simulations are based on acute care patient presentations requiring PCP students to respond to a dispatched call, stabilize the patient at the scene, and then transfer the patient to the nearest emergency department for treatment by the inter-professional team. Once the patient is stabilized, the PCP and SRT students will work as a team to transfer the patient to the nearest tertiary care hospital.

## 14 STUDENTS AS TEACHERS? DEFINING PROFESSIONAL IDENTITY WITH PEERS

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Inter-professional education (IPE) is increasingly acknowledged as an essential element for patient safety in healthcare and as a standard for healthcare education by accrediting bodies and professional organizations. Research regarding IPE has significantly evolved over the past decade; however there remains a lack of clarity as to when and how IPE should occur within an education program, and whether IPE ultimately impacts professionals' practice.

A partnership was formed between the SAIT Respiratory Therapy and Mount Royal University Bachelor of Nursing programs to investigate the influence of a collaborative nursing lab on participating students' knowledge, attitudes, and beliefs about IPE. A Readiness for Inter-professional Learning Scale (RIPLS) questionnaire was administered to both groups of students before and after participating in this lab. RIPLS subscale scores for teamwork and collaboration, and positive professional identity increased significantly for nursing students post lab.

This study also examined the accomplishments of this collaborative lab for both sets of students, in particular the construction of their professional identities. An analytic interpretive approach to discourse analysis was used to analyze data gathered through individual interviews and focus groups. The non-evaluative student-to-student learning that occurred in this lab contributed to an atmosphere less constrained by mechanisms of power inherent in instructor led labs or clinical experiences. Students' narratives revealed that inter-professional learning, building of relationships, and construction of their professional identity was supported in this nonhierarchical simulated clinical encounter. Understandings generated from this study could support the thoughtful integration of IPE into health professionals' curricula and support the development of their practice.

## 15 CLINICAL EDUCATION IN THE COMMUNITY HOSPITAL

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Oakville Trafalgar Memorial Hospital is a community hospital that will become a student placement location as of 2018. As a community hospital there are strengths and limitations to the student experience, but also great room for growth. Steps were taken to assess, adapt, and implement changes to ensure a successful student placement program.

In a community hospital, RTs have many opportunities for hands-on skills, such as intubation and arterial line insertion, but a community hospital is not a specialty service center. There is variance amongst staff in levels of experience as a preceptor, which results in some staff feeling unprepared for what to expect and how to assist the students in achieving their requirements. Less educators are available to oversee students and their completion of competency requirements. These needs differ greatly from those of a tertiary hospital. The needs and concerns of staff are evaluated and addressed. Student needs are discussed in regard to observation, evaluation, and support to achieve all competency requirements. All of these aspects were evaluated and explored, and a program was developed to ensure student and staff success in the transition to being a teaching centre for respiratory therapy students. As the number of Respiratory Therapy programs increase, the demand for placement hospital opportunities will also increase. Our framework for success can guide hospitals that have been uncertain of becoming involved in student placement.

## 16 MCQ: BREAKING DOWN COMPETENCIES INTO QUESTIONS

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Many health professions in Canada require students in their respective fields to write credentialing exams in order to enter into practice. These examinations are created for the regulatory bodies of the profession to be able to assess entry to practice competencies. The examination design many health professions use for these examinations are a multiple choice question (MCQ) format, administered online. The stakes of these examinations are high for the students seeking their licenses, for the regulators concerned with the competency of future health professionals, and to the public in terms of the quality of care that they receive. Various literature states that MCQs can provide vital information on the student's ability to make clinical decisions as long as the questions are well constructed. The literature amplifies the importance of professional programs and their legal and ethical responsibilities to stakeholders to produce high quality,

valid exams. As educators writing MCQs on a daily basis, are we designing high quality questions that truly test competency?

## 17 UNDERSTANDING THE CBRC EXAM

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The Canadian Board for Respiratory Care exam has evolved over the years and is now predominately a case-based exam that is administered online. This presentation will provide an overview of how exam questions are written, developed and selected for the exam. It will also provide insight into the taxonomic levels evaluated by the exam, the processes used to review the exam after it has been written, and will address some common questions and misconceptions around the CBRC exam.

### EMERGING PRACTICE

## 18 GETTING ALL ON BOARD FOR BETTER CARDIORESPIRATORY HEALTH!

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**BACKGROUND:** Guided by a growing movement in which health promotion, disease prevention, and healthy lifestyles are high on the agenda in Canada, as well as in many other countries around the world, the OPIQ proposed in 2016 a strategic orientation containing the positive and mobilizing message; "A better cardiorespiratory health for all!" Ultimately, this strategic direction, which puts forward our leadership in cardiopulmonary health and care, will serve to position the clinical practice of respiratory therapists downstream as well as upstream of medical diagnosis.

**QUESTIONS:** How can respiratory therapists prevent cardiorespiratory diseases effectively with sick patients when they were first trained to participate in their diagnosis process and their treatment? In other words, how can they address promotion of health and prevention of diseases efficiently with sick patients while caring for them? And as a regulatory body, how does the OPIQ motivate its 4280 members on board towards this change of practice? How does it lead them in that direction? Last, but not least, how does it help respiratory therapists to place health promotion, disease prevention and healthy lifestyles at the heart of their clinical practice? That is where the challenge is!

**DISCUSSION:** In addition to defining the new strategic orientation, the presentation will describe the operational plan (2016–2021) for the "In cardiorespiratory health!" program. A variety of communication strategies will be discussed in order to assist leaders in the implementation of such a tailored program for respiratory therapists. Preliminary results related to the appropriation of the program by respiratory therapists will also be shared with the audience.

## 19 GETTING BEHIND THE WHEEL: RTS DRIVING RESEARCH

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In many academic centres, respiratory therapists (RTs) participate in research. In the ICU setting, most RT research involvement relates to the

support of physician-led research and includes activities such as following ventilation protocols and completing data collection forms. Much less common are studies led by RTs. For many clinical RTs, the design, implementation, analysis, and publication of a research study may seem like daunting tasks. For RTs whose focus and experience is clinically-oriented, the idea of leading or participating in an RT-led study may highlight challenges related to limitations in time, resources, and research experience. At St. Michael's Hospital [SMH], a Centre of Excellence in Mechanical Ventilation in Toronto, Ontario, building capacity to support RT-led research is an ongoing priority and RTs seeking the opportunity to develop research projects can access a variety of resources to support the pursuit of their ideas. "A Prospective Observational Study of Extubation Delay in Critically Ill Adults" is an example of an RT-led research project currently underway at SMH. This single centre, prospective observational study is being led by RTs with varied clinical and research experience, who have come together to conduct and answer this clinical research question. The genesis for this project was RT concerns about timely extubation in patients deemed ready for liberation and a desire to better understand the reasons for delays. Together, the group searched the literature and designed a data collection form to capture extubation delays and contributing factors, modifiable and nonmodifiable, in two ICUs—one serving a general medical-surgical population and the other caring for patients with trauma and/or neurosurgical conditions. This study will be presented as an example of an RT-led research project and used to highlight various aspects of research conduct, including: generating the idea and question, forming the team, developing a protocol, seeking funding, obtaining REB approval, implementing the study, engaging staff and collecting data, and analyzing data to describe results.

### 20 ANTIMICROBIAL NITRIC OXIDE IN CYSTIC FIBROSIS

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Nitric oxide (NO) is a naturally occurring nanomolecule synthesized by mammals. NO plays a major role as a secretory product in the homeostasis of the vasculature and is an integral component of the innate immune system. Using a *P. aeruginosa* pneumonia rat model, we demonstrated that NO can be administered both safely and effectively. We have also shown that inhaled gaseous nitric oxide (gNO) can be safely administered to healthy human volunteers at an optimal antimicrobial dose of 160 ppm gNO over 30 minutes administered five times a day for 5 consecutive days. This dosing also appeared safe when applied to human alveolar cell-line and was effective at eradicating several gram positive and gram negative bacteria, even when the bacterial loads were as high as those achieved in clinical sputum specimens. Recently, it was shown, in a small cohort of CF patients, that delivery of 160 ppm gNO for 30 minutes, three times a day for 10 days, was safe and had beneficial effects on lung function and sputum bacterial load reduction. A Phase 2, multicenter trial, of gNO in CF is currently recruiting subjects. The antimicrobial use of gNO may provide new opportunities for respiratory therapists.

### 21 PHLEGM-FREE SINCE '13: AN RT IN QUALITY

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Using a visually engaging format, the speaker will outline his step-by-step transition from frontline clinical Respiratory Therapist to a full-time role in Quality and Patient Safety. Special emphasis will be placed on explaining the many quality and patient safety opportunities available to respiratory therapists, including the benefits of taking this rewarding path. This presentation is designed to reveal how exciting and abundant these

opportunities can be, while dispelling the misconceptions commonly associated with these non-frontline roles.

### 22 NON-PERFUSED ORGAN (LUNG) DONATION

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With the continuous demand for organ and tissue transplants, there is a need for alternate and innovative methods to increase the number of organ and tissue donors. William Osler Health System (Osler) currently collaborates with Trillium Gift of Life (TGLN) to increase lung organ donors by applying Non-Perfused Organ Donation (NPOD) and offering families an opportunity for donation after unanticipated death. With a crucial window of 180 minutes, a streamlined screening tool and the coordination of a recovery team, NPOD has provided opportunities for lung organ donation after unanticipated cardiac arrest. This presentation explains Osler's practice for organ and tissue donation, including precise criteria and screening tools used, the vital role of the RRT within this structure and how NPOD can contribute to increasing lung organ transplants. Dr. Andrew Healey, Medical Director of Critical Care at WOHS, leads NPOD with the support from the Trillium Gift of Life Network (TGLN).

### 23 RESPIRATORY THERAPY IN PERU: CULTIVATING EDUCATION

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Respiratory health is a global burden, so why are respiratory therapists limited to providing care to just one community, one province, or one country? The Thompson Rivers University Respiratory Therapy program has created an opportunity to bring respiratory care to both urban and rural regions of Peru. This idea was conceptualized 6 years ago by two RT students who set out to see how they could sustainably bring equipment to a country in need. After formal organization between RT leaders at TRU and a Peruvian Pulmonologist a subsequent, annual "RT mission trip" was formed. Their goal was to provide much needed technical equipment, and the education and bedside respiratory care to facilitate the sustainability of respiratory health of Peruvian citizens. This novel opportunity by TRU has led to the participation of many student RTs and practicing RRTs alike. The program gives opportunity to all types of RRTs: students, instructors, community therapists, critical care therapists, neonatal and pediatric specialties, as well as anesthesia. We will reflect on the challenges, surprises and teamwork involved. Locally developed but globally concerned, TRU is making a difference in Peruvian healthcare. With connections now expanding to other areas of Peru, the dream of sustainability and respiratory care can continue to grow and develop. Respiratory therapists are needed in a big way, in a small country whom are just beginning to discover the depth and aptitude of our discipline.

### 24 LE THÉRAPEUTE RESPIRATOIRE DANS UN RÔLE DE LEADERSHIP EN SOINS CRITIQUES -EST-CE POSSIBLE?

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Development in healthcare is exponential. Patient-centered care is a standard of practice and RTs have become an essential member of the

interdisciplinary team, but can we do more? Can we lead projects and be front-line players? RTs have to share their unique expertise, their clinical skills, their knowledge and be proud of what they do. As a professional health care provider and a respiratory care leader, RTs should jump in every opportunity or act as a catalyst in hospital development. We will discuss two projects in the speaker's hospital: one where RTs are the primary care provider for a term baby after an uncomplicated C-section in the operating room, without immediate medical assistance; and another where RTs take the lead in acute asthma at the emergency in the first hour before the medical evaluation and the hours after the first medical evaluation. With some tips, better communication and focus to develop our leadership skills, we cannot expect more than better outcome for patient.

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### ADVANCED PRACTICE RESPIRATORY THERAPIST ROLE DEVELOPMENT

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**BACKGROUND:** Through an environmental scan it was identified that an Advanced Practice Respiratory Therapist (APRT) role is unique in Canada in providing clinical care services to children with complex cardiorespiratory care needs. Other advanced practice roles in nursing and physiotherapy have demonstrated success in providing advanced comprehensive care, education, research, professional leadership and support of systems. The following principles guided the design and creation of the APRT role: Best practices in client and family centered care; Culturally appropriate care; Partnerships with family leaders; Lived experiences of family in transitions home; Excellence in client and family experience; and Quality improvement and safety.

**METHODS:** A multi-pronged approach was used. Stakeholders included families, front-line staff, leadership, physicians, community and acute care partners, and regulatory bodies for respiratory therapy. Tools used included semi-structured interviews, surveys and narrative analysis. Role design incorporated:

- Knowledge translation and capacity building in cardiorespiratory care
- Transform how clients access, enter and move through the healthcare system – acute care to Holland Bloorview to community
- Partner to share expertise with community stakeholders
- Identify gaps in services to children and youth and how to create seamless integration
- Stakeholder input to identify key points of high risk in the continuum of care that requires care coordination
- Create competencies and medical directives for access to equitable services
- Enhance scope of practice for respiratory therapists, nurses and other professionals to enhance overall care of the client
- Mentorship with physicians in cardiorespiratory care to build expertise

**DISCUSSION:** Evidence of sustainability for the APRT role includes the following:

- Maintains collaborative partnerships with families, clinicians and physicians through feedback & evaluation
- Maintains clinical competency and proficiency related to knowledge, skill and awareness of childhood disabilities
- Utilizes tools for ongoing assessment of role, evaluation and feedback in a phased approach
- Undergoes ongoing professional development, continuing education and research
- Acquired leadership support within organizational structure
- Engage in peer evaluation, reflective practice and case studies
- Maintain partnerships with the College of Respiratory Therapists of Ontario and educational institutions

**RESULTS:** Outcomes of change include:

- Improves quality, safety and effectiveness of cardiorespiratory care for children through client-family-centered collaboration

- Reduces length of stay and supports timely transitions to the community
- Promotes consistent and standardized care to children in a medical model with part time respirologist services
- Improves quality of life for children in the community and increases family satisfaction
- Reduces the burden of care for families as this role follows the child to the community one month post discharge until first clinic visit
- Integrates APRT within the healthcare system to ensure seamless transitions for clients and families

## LEADERSHIP FORUM

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### JUST IN TIME TRAINING: LESSONS FROM AN RCT

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Just-in-time training (JITT) involves short educational sessions that can be effectively implemented in the health care setting. These sessions focus on a specific skill and occur within a relatively short time frame prior to the skill being used when engaging in patient care. This innovative educational approach is in alignment with thoughts from cognitive load theory, which suggests that an individual's working memory limits the amount of information they can process at any time. This is of unique relevance to the field of respiratory therapy practice, as daily work and procedures are often complex and may require a cognitive load that exceeds the working memory of that individual. Additionally, many procedures are often performed infrequently; and JITT can be utilized to "refresh" skills prior to performance in the clinical setting. Given that the daily workload of respiratory therapists across many health care settings involves procedural tasks, advanced skills, and the ability to work as an interprofessional team; there is a promising opportunity to apply JITT as an educational approach for RRTs. At the Hospital for Sick Children, a prospective, randomized controlled intervention study looked at how JITT could be utilized to reduce cognitive load through learner-oriented, simulation based education sessions that focused on specific tasks (CPR and medication administration) and close proximity to actual skill performance in the health care setting. The study evaluated how the use of JITT could improve subsequent skill performance, and potentially have an impact on team-based performance in complex hospital environments. The study involved forty-four teams of interprofessional health care providers who participated in in-situ mock code simulations. Results from the study have shown that teams who received JITT prior to their mock code simulation demonstrated improved CPR compression depth, adherence to medication administration standards when providing epinephrine via IV, and overall team-based performance, when compared to teams who did not receive JITT. Preparation and implementation of the study protocol and subsequent dissemination strategies required buy-in from key stakeholders, including nursing educators, local managers and leadership, as well as from oversight of resident trainees. This was crucial in being able to promote JITT as a worthwhile innovation to pursue in a busy, high acuity clinical setting with many competing priorities.

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### WANT TEAMS LIKE A FERRARI PIT STOP CREW?

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Many RT leaders are overwhelmed by the challenges in the current dynamic healthcare system. The demand for high quality services, limited resources,

higher patient acuity, never-ending best practice guidelines and hospital initiatives implementation are probably familiar to most leaders. This requires clinicians to be adaptable and behave differently, and effective teamwork is essential. However, leaders will often implement “quick fixes” rather than building a high-performing team that is resilient to change. Unfortunately, the layer of band-aid gets thicker and thicker, and yet behavior doesn’t change. How can we build a resilient culture in our complex healthcare environment? “Culture eats strategy for lunch”; having a high-performing team is more efficient than any strategy.

The Ferrari pit stop crew is known for their consistently high levels of performance. The key to success of a high performing team is 1) shared common goals, 2) clear role and responsibilities, 3) effective communication, 4) having the standardize expectations, and 5) ongoing continuous improvement processes embed in their routines. Moreover, leaders also need to have appreciation and able to identify the sources of influence for their team in order to facilitate changing behavior. A leader can use many tools; however, it is very important to choose one that is most meaningful to the team. There are many tools and methodologies one can find in “Google” for each of the 5 key components to a high performing team. Different tools have different strengths and weakness that might be more suitable for your team and work environment. Some tools that will be reviewed and discuss are: team charter vs appreciative inquiry methodology; SWOT analysis vs competencies mapping; shadowing vs processes mapping exercise; newsletter vs town halls vs huddle board; policies vs standard work; 5 whys vs fish bone analysis. Lastly, the importance of audit tools and setting meaningful metrics will be discussed.

There is no cookie cutter strategies or perfect solution for the complexity environment we all work in. Each team will have their unique culture and a process that will drive continuous improvement. Therefore, as a leader, you need to be sensitive to the environment in order to build a high performing team.

## **28 EMPLOYEE ENGAGEMENT**

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Literature has identified that a shift in our organizational culture towards enhanced employee engagement could improve relationships with patients and between employees within a hospital setting. Through this, relationship organizations have higher customer satisfaction, improved staff retention, and a more productive workforce. While the evidence continues to support the fact that high employee engagement is important for success, many organizations are failing to implement these suggested strategies. This presentation will discuss a project that completed an action research cycle aimed at identifying stakeholder perspectives of employee engagement while taking into consideration the impact that these changes may have on a Respiratory Therapy department in a tertiary care hospital and its external stakeholders.

Two qualitative research methods were used to gain diverse perspectives and to ensure the richness and depth of the data collected. The first method used was in-person, semi-structured interviews. Themes were identified and pulled from these interviews and presented at the beginning of the second qualitative research method to help guide the discussion. The second method used was structured focus groups. The focus groups provided a manageable, yet comprehensive and diverse, set of opinions and perspectives. Based on the study findings, conclusions and a review of the literature, the following recommendations were made: 1. Managers can empower employees through frequent and meaningful interactions; 2. Support organizational change through two-way communication and ensure the resources to provide the change are accessible; 3. Use the personal connection of patient and employee stories to connect with employees; 4. Link employee engagement to organizational vision and values.

Successful implementation would depend on an organizational priority of employee engagement and alignment with the organization’s vision, values, and strategic direction. Both staff and the leadership team must take ownership and contribute to identifying solutions to ensure a positive change within the organization. Small changes in leadership practices can inspire positivity and motivation in staff. Frontline respiratory therapists have an amazing ability to engage each other when they feel optimistic and empowered. Engagement is contagious and spreads quickly. Implementing the recommendations of this inquiry could ultimately assist a Respiratory Therapy department to support a health authority in meeting their goal of patient focused high-quality care.

## **29 PRACTICE GUIDELINE AND PROGRAM DEVELOPMENT: BUILDING ORGANIZATIONAL CAPACITY**

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To be forefront in prevention and treatment of respiratory disease, organizations must possess capacity for the efficient and timely creation of evidence-based programs, standards, and clinical practice guidelines. This interactive session is designed to give attendees a comprehensive yet practical introduction to established procedures, instruments, and training resources that can be used to support the development/creation of such products within their organizations. The judicious use of these resources (procedures and tools) is of course dependent upon an organization’s capacity for making evidence based decisions. Therefore, this session will also provide attendees the opportunity to reflect upon their own and their organization’s competency in the skills essential to applying the principles of evidence based practice.

Specifically, we will consider current expectations of the following: 1) systematic searches for potentially relevant knowledge; 2) critical appraisal of found knowledge for its validity and its applicability to an organizations context (e.g. expertise, financial realities, and community/client expectations) and; 3) integration of valid and applicable knowledge during the creation/development of programs, standards and practice guidelines. To support attendees in their future efforts to identify and close gaps in their organization’s evidence-based practice skills, a collection of freely available tools and training materials will be reviewed. The session will conclude with a discussion of why it is essential that intended outcomes of newly implemented products (programs, standards and practice guidelines) are both measurable and planned. Attendees will receive an electronic compendium of resources for supporting their organizations efforts in the development/creation of programs, standards and practice guidelines.

## **CRITICAL CARE**

## **30 THE EPIDEMIOLOGY OF ARDS MANAGEMENT**

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In 2017, the American Thoracic Society published new evidence based guidelines for the management of ARDS patients based on the available evidence to date. In 2016, JAMA published The Large Observational Study to Understand the Global Impact of Severe Acute Respiratory Failure (LUNG SAFE). Since then, further studies have been published with this data demonstrating clinical practice in these patients and potentially modifiable factors to decrease mortality. This presentation

will provide an overview of the evidence based ATS guidelines (T. Piraino), followed by the global practices (T. Pham, one of the authors of LUNG SAFE) comparing what we should be doing to what we are really doing globally to manage these patients. The speakers will also provide a brief description of regional differences by continent, with additional data from Canada.

### 31

#### **ECPR: IMPLEMENTING A SERVICE FOR OUT-OF-HOSPITAL CARDIAC ARREST VICTIMS**

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Extracorporeal Cardiopulmonary Resuscitation (ECPR) is a form of Extracorporeal Membrane Oxygenation (ECMO) implanted during cardiac arrest. Emerging data suggest that ECPR may improve survival in certain patients who experience out-of-hospital cardiac arrest (OHCA) and are unresponsive to conventional CPR methods. However, patients who experience OHCA demonstrate significantly worse outcomes when compared to patients who suffer from cardiac arrest in hospital despite having better prognostic indicators. A key factor for this may be the logistical challenges associated with optimizing arrest-to-ECPR time for out-of-hospital patients. Survival data indicate that positive neurological outcomes are strongly correlated with time from the initial out-of-hospital cardiac arrest to ECPR initiation.

To improve access to ECPR and optimize time from OHCA to ECPR initiation, St. Paul's Hospital developed a regional clinical ECPR protocol. The protocol is the first of its kind in Canada and focuses on creating interdisciplinary collaboration between the pre-hospital setting and the emergency department to facilitate early identification and transport of ECPR candidates. The protocol also outlines a coordinated multidisciplinary team response to ensure timely ECPR initiation upon hospital arrival. The presentation will provide an overview of the process of developing an ECPR protocol from a quality improvement lens. It will share the successes and challenges associated with this groundbreaking work as well as the experiences of our patients and health care team members.

### 32

#### **RECOGNIZING AND CORRECTING PATIENT-VENTILATOR DYSYNCHRONY**

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The primary objective of the program/presentation is to provide an interactive learning experience with respect to the use of mechanical ventilator waveforms in patient assessment. This presentation will describe how to interpret waveform scalars for the presence of patient-ventilator dysynchrony, discuss the cause and clinical implications of the dysynchrony, and finally provide recommendations for modifications to set ventilator parameters in an attempt to correct the dysynchrony.

### 33

#### **AIRWAY MANAGEMENT PAUSE - MAKING SAFE, SAFER**

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Airway management can be a high stress and high cognitive load situation. Communication practices around airway management were not defined in a standardized process, as typically demonstrated by silos of communication between the members of a multidisciplinary team, and

the team as a whole most often did not exchange information prior to the event start. This contributes to opportunities for communication errors and omissions, which are known to contribute to adverse events.

"Communication failures are the leading cause of inadvertent patient harm." (Leonard, Graham, & Bonacum, 2004) The Joint Commission for Hospital Accreditation found that in 70% of 2455 sentinel events the primary root cause was communication failure—and in 75% of those, the patient died (Leonard, Graham, & Bonacum, 2004).

Our objective was to introduce a standardized communication tool to support team communication and function, to mitigate some of the errors that can occur during airway management, as well as to reduce cognitive load and stress. The tool is an Airway Management Pause, wherein the members of the team, usually an MD, RN, and 2 RRTs, will stop, once they have completed their preparation for the procedure, to go through a checklist prior to medications being given or the procedure being started. The primary goals are for the team members to be empowered to speak up and contribute to planning, and to share the same mental model before proceeding. The Airway Management Pause mimics examples such as the Surgical Safety Checklist, the FMC OR to ICU handover, and the Procedural Sedation Checklist.

Checklist benefits include: reduced cognitive overload, reduced task fixation with improved situational awareness, reduced stress, defined team member roles, improved team functions and communication, and improved team understanding of potential complications and what they will be expected to do. Checklist use can make crisis management and high-stakes procedures such as RSI smoother and quicker (when well-practiced at using the checklist).

A quality improvement evaluation of our project was undertaken and we hope to demonstrate an improvement in the communication environment during airway management and reduce the number of complications that occur during airway management events and improve team function.

### 34

#### **RESPIRATORY DISTRESS IN PREGNANT WOMEN, OH NO!**

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Respiratory distress in a pregnant women could be a "one of a kind" challenge. As RTs and health care provider, our unique expertise in airway management could be cherry in top when it come to manage this critical situation. Collaborative practice is the direction health care is moving and interprofessional teams have been shown to improve patient care. We have to be a part of it. Although this is not common at the emergency room, RTs should be prepare to face off and demonstrate their autonomy to maintain their skills to provide the best care base on best practice. Their role grows over the time and they are an invaluable member of the interdisciplinary team.

### 35

#### **REDUCING ATELECTASIS TO MITIGATE INJURY IN THE LUNGS, DIAPHRAGM, AND BRAIN**

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**BACKGROUND:** Positive pressure mechanical ventilation allows severely ill patients to be stabilized and supported, yet it is expensive and complex. One-third of patients are considered "difficult to wean" from the ventilator. Those who require more than seven days of weaning comprise 10% of the ventilated population and are responsible for over 40%

of total ICU patient days. Managing these patients is expensive, consuming approximately 12% of all hospital budgets. Duration of ventilation is an independent predictor of poor outcome, particularly in patients who are greater than 66 years of age with more than two weeks of positive pressure ventilation. They sustain the worst disability and have a 40% 1-year mortality. Atelectasis, a complete or partial collapse of a lung or lobe of a lung, is common in the ICU. Atelectrauma is caused by altered alveolar mechanics due to changes in alveolar size and shape during mechanical ventilation. This results in cyclic recruitment and derecruitment. Increased atelectasis-related pulmonary shunt exacerbates hypoxia and hypercarbia, requiring more ventilation and oxygen to support the patient. Atelectrauma drives inflammation in the lungs that can trigger systemic inflammation and sepsis. Lung injury also drives apoptosis in the hippocampal area of the brain, perhaps contributing to memory loss in these patients. Diaphragm atrophy results from the lack of use of the diaphragm for ventilation and contributes to weaning failures in the ICU. A common and effective strategy to minimize atelectasis is to facilitate spontaneous assisted breathing to keep the diaphragm contracting as soon as is clinically possible.

**METHODS:** We are conducting a preclinical nonrandomized study in an animal model for 50 hours in a mock ICU. These methods are an extension of a previous successful study in which my research group demonstrated mitigation of diaphragm atrophy by pacing during mechanical ventilation. There are 2 ventilation conditions (normal positive pressure ventilation and controlled diaphragm contraction in synchrony with ventilation), both delivering a safe tidal volume of 6–8 mL/kg. A second series of pigs will have these conditions repeated however, their which their lungs will be injured through an Oleic acid infusion, an accepted model of Acute Respiratory Distress Syndrome.

**SIGNIFICANCE AND IMPACT:** We will show that keeping the diaphragm contracting during the course of mechanical ventilation reduces atelectasis and reduces injury to the lungs, diaphragm, and brain. This has the potential to provide a novel method of ventilation in patients with acute respiratory lung disease, and may help to reduce the ventilator-induced lung injury associated with conventional positive-pressure ventilation. This will inform clinical practice and develop a method of mechanical ventilation that does less harm and results in less long-term sequelae in patients and less resource drain on the health care system.

NEONATAL AND PEDIATRIC

**36**  
**WHAT IS NEW WITH SURFACTANT?**

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Surfactant administration for treatment of neonatal Respiratory Distress Syndrome (RDS) has been a revolutionary advancement in the field of neonatal care over the past 25 years. Since the adoption of its routine use it has dramatically reduced mortality and morbidity in the youngest of patients. Respiratory therapists (RTs) are an integral part of the team managing the care of these neonates and are often the clinicians who administer surfactant. A review of the governing principles of surfactant delivery will be discussed. Various types of surfactant also exist and differences will be highlighted. Traditional techniques including selective intubation, surfactant delivery and mechanical ventilation have become less frequent in favour of INtubation SURfactant Extubation (INSURE), the current gold standard.

However, in recent years, new approaches have emerged and show evidence of improved outcomes. These include decreased risks

associated with intubation and mechanical ventilation, in particular reduced rates of Bronchopulmonary Dysplasia (BPD). One proposed method is Minimally Invasive Surfactant Therapy (MIST). This involves the placement of a small catheter in the trachea of a non-sedated patient, and instillation of surfactant to the neonate's lungs while maintaining spontaneous patient efforts. This is done while the patient is supported on Non-Invasive Ventilation (NIV). Another approach entails the delivery of surfactant through a nebulizer, also using NIV support.

Randomised control trials are currently underway across continents to assess these two new approaches. Benefits and limitations of these interventions will be presented and discussed. Other past and possible delivery options for surfactant delivery will also be examined.

A review of current evidence including Cochrane Reviews and meta-analyses, ongoing trials, and future directions will be presented. Ideally, time will allow for audience discussion regarding practice differences and experiences from different locations across the country. It is important for RTs to be aware of emerging trends in this field. RTs must continue to advocate for their patients and ensure the most appropriate interventions are being performed while ensuring the best possible outcomes for their patients.

**37**  
**PEDIATRIC INDIVIDUALIZED REGIONAL VENTILATION USING ELECTRICAL IMPEDANCE TOMOGRAPHY**

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Ventilation distribution in patients mechanically ventilated is often inhomogeneous. Unfortunately, hardly any established clinical tools possess the ability to assess regional ventilation in patients. Approaches to select "individualized PEEP" are based on its effect on respiratory mechanics, focusing on driving pressure, plateau pressure or transpulmonary pressure. These methods share the limitation of "lumping" heterogeneous processes within the lung into one measurement. Ventilator settings should be adaptive to individual disease stages and regional inhomogeneities of the lung. While PEEP and other ventilator settings are utilized to attenuate the inhomogeneity of tidal ventilation, information on evolving regional lung function is not typically available at the bedside. Thoracic electrical impedance tomography (EIT) is an emerging imaging modality that can track real-time changes to regional lung volumes at the bedside.

In this session, we will present one Canadian pediatric centre's utilization of thoracic EIT to guide individual mechanical ventilation in pediatric patients. This will be presented using real patient case examples and discussing several EIT parameters that have been developed on ventilation distribution to optimize ventilator settings. EIT is certainly one of the most promising techniques for the development of individual therapeutic strategies in the ventilation of pediatric patients and is changing how we look at ventilating pediatric patients.

**38**  
**DIRECTIONAL FLOW EVALUATION OF AN AEROSOL DELIVERY MODEL**

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Delivery of aerosols to pediatric patients can be accomplished in many ways. Whether it be the delivery devices themselves or the circuits the aerosols travel in, the goal is to optimize deposition of the drug where it

is needed. Various delivery models have been investigated and are used as evidence for best practice today.

The difficulty in pediatrics resides with the practicality of the studies currently available and considered. Often studies assessing the question of optimal deposition or lung dose make use of controlled in vitro models that have a limited reflection of the patients we care for. Thus, practice is often derived from these in vitro models because of the limited availability of in vivo models. In vitro studies consider variables such as, airway, circuit, delivery device, flow, and particle size whereas they can't assess breathing patterns and the quantity of expired aerosols.

The objective of this presentation will be to present a site-specific challenge in the delivery of aerosolized medications to intubated pediatric patients. To share a benchmark approach to alternative models in this practice and evaluate the direction of the aerosol within the model. It will share the challenges faced with presenting new evidence/ideas to practice and open a dialogue for others that experience practice challenges in caring with this population.

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### HEATED HIGH FLOW OXYGEN FOR THE PEDIATRIC PATIENT: CREATING AN E-LEARNING OPPORTUNITY

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At BCCH, the role of heated high flow oxygen for the pediatric patient with bronchiolitis was critical. Many of the bronchitis patients were spending time in PICU and not in the inpatient units, and this was creating an issue with bed availability in the PICU. Being the pediatric referral centre for BC, we had to address this issue and identify the key components that would facilitate the patients on heated high flow oxygen being cared for on the inpatient units. The main objective identified was the comfort of the RN in caring for these sick infants. Adding to this task, we were moving into a new hospital with 30% increase in RN staff, many of whom were new graduates with little pediatric experience. By developing an e-Learning experience we wanted to ensure the learner felt they had mastered the content and understood all concepts, and if they did not, they could go back and review key learning objectives on their own. Once they were comfortable, they would then do the competency skills with the respiratory therapists to ensure they were knowledgeable and had mastered the skill set. Lastly, we wanted to make this same e-Learning available for use throughout BC.

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### DIFFICULT NEONATAL AIRWAY CASES: RTS CONTRIBUTIONS

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**BACKGROUND:** The Neonatal Intensive Care Unit (NICU) at SickKids is an outborn quarternary care facility that receives patients from throughout Ontario for specialized neonatal care, including specialized treatment for conditions involving the airway. The difficult neonatal airway can be interpreted as any neonate with an airway condition that makes them difficult to oxygenate, clear carbon dioxide, intubate or mechanically ventilate. These conditions may occur on a spectrum that runs from: potentially difficult, known difficult to unexpectedly difficult.

**OBJECTIVES:** To present and share the practice points encountered from actual cases encountered in our NICU to the audience. These cases are chosen to show both successful and unsuccessful strategies and application of existing guidelines as well as how and when "de novo" solutions were provided to unique conditions.

**METHODS:** Actual case studies of patients from our NICU will be chosen that serve as examples of difficult airways along a continuum that includes potentially difficult to known difficult to unexpectedly difficult.

**RESULTS:** Our case studies indicate that several elements were required for the successful management of difficult airways in these cases in our NICU. These elements included specialized equipment, expertise, collaboration, education and "de novo" innovation.

**CONCLUSIONS:** The difficult airway in the NICU may pose challenges to oxygenation, carbon dioxide clearance, intubation and mechanical ventilation. Our case studies show that in many cases no one provider has the knowledge skills and expertise to solve all of the potential challenges posed by a difficult airway and that the technical and clinical knowledge of respiratory therapists makes them a key partner in managing this patient cohort.

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### JET 58: HFJV AND CONFESSIONS OF A NICU MOM

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Initiating a new ventilation program can be challenging. It involves multiple stakeholders who need to understand the therapy and also agree on strategies, techniques and management. The impact of these interventions of patients and families must be considered as well. In this presentation we will discuss the implementation of the HFJV program at Royal Columbian Hospital and the learnings along the way. This includes the creation of a ventilation standard, appropriate timing of the intervention, and subsequent modifications with complementary strategies to allow skin-to-skin on the HFJV. In addition, we will present the story of a baby girl, Hazel. We will hear her journey of 6 months in the NICU from her mother and the RTs that cared for her. We will share her 58-day "flight" on HFJV with multiple respiratory interventions, including unique "outside of the box" events. Family experience from admission to discharge will be highlighted, including knowledge of the NICU environment, feedback on improvements from family, and post-discharge.

## COMMUNITY AND CHRONIC CARE

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### VACCINE PERSPECTIVES AND VACCINES RELATION TO ASTHMA

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It has been claimed that vaccines have been the most advanced step in preventative medicine, saving countless lives every year. However, in recent years vaccination efficacy and safety policies have been called into question. This can be attributed to the anti-vaccination movement that has developed over the last two decades. The movement's primary focus being the Measles Mumps and Rubella (MMR) vaccine and its link to autism. Another belief is that pharmaceutical companies receive shocking profits from mass immunization. It is true the vaccine market was worth approximately \$24 billion in 2016 and is projected to grow to be worth \$61 billion by the year 2020. This seems deterring, but the more important question to ask is not: are vaccination companies motivated by money? It is: are the products they are producing still safe and effective even if they are motivated by money? And the answer is an overwhelming yes. Vaccines save countless of lives every year in Canada alone; mortality rates from measles decreased from 535,300 deaths in 2000 to 139,300

deaths in 2010. For others, making the decision to vaccinate is contingent on their asthma. Will it prevent or cause asthma exacerbations? Vaccinations have been the center of controversy for many years. Misinformation about vaccines is widespread, which causes distrust in the effectiveness and the motives of the recommendation to immunize against vaccine preventable infectious diseases. Although the scientific evidence is on the side of the pro-immunizers, it is important that all sides be heard so that open discussion can be had and any conspiracy theories can be addressed. It is important for health care workers to be informed of the circulating information so that when questioned, they feel confident in their answers and can appease questioning parents and patients.

### 43 OUTCOMES OF USING APPS TO DELIVER COPD SELF-MANAGEMENT

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**BACKGROUND:** Chronic obstructive pulmonary disease (COPD) is one of the leading cause of mortality and morbidity in Canada. The Public Health Agency of Canada reported in 2011 that 45% of those diagnosed with COPD felt that their overall health was fair or poor. Appropriate self-management may include pulmonary rehabilitation, smoking cessation and pharmacotherapy, and may help preserve lung function, reducing the risk of exacerbations. However, encouraging self-management in people with chronic diseases can be challenging. With the increasingly popular use of electronic and mobile devices, the potential use for motivating self-care with this platform is plausible.

**OBJECTIVES:** 1. To summarize the potential outcomes of using mobile apps to deliver COPD self-management and 2. to identify potential benefits and limitations of COPD targeted mobile apps.

**Method:** PubMed databases were utilized to collect studies with the focus of using mobile apps as their method of intervention. Search term combinations included "COPD and apps", "COPD and mobile technology". Primary articles that reported patient clinical outcomes or assessed user-experience of mobile apps in COPD management were included.

**RESULTS AND DISCUSSION:** Currently, there is little literature to demonstrate the effectiveness of using mobile apps for COPD self-management. A Cochrane systematic review reported that mobile apps targeted at supporting COPD self-management have significant effects in improving quality of life and activity levels compared to conventional methods of support. However, long-term effects of the use of these apps are not conclusive. In the retrieved interventional articles, the target of COPD management in the mobile app intervention varied across trials. Some studies focused on investigating mobile apps providing pulmonary rehabilitation regimes, or physical activity motivation. The outcomes of these interventions show clinical benefits, including improved exercise tolerance, decreased dyspnea, and increased muscle strength. Meanwhile, other studies reported that the use of mobile apps to encourage self-management yielded no statistical significance in their health status. Despite the uncertainties of their clinical benefits, several studies reported positive user experiences with the mobile apps. Mobile apps as a platform to self-management and support from health care providers are feasible and acceptable. Furthermore, the use of mobile apps allows care plans to be individualized to each patient's goals, self-monitoring and education. Although this modality is favourable, there are limitations that may include financial accessibility and literacy barriers.

**CONCLUSION:** The use of mobile apps to support COPD self-management is still relatively new, but promising. There is a lack of literature to support the use and prescription of mobile apps in replacement of conventional methods. Due to the uncertainties of using mobile apps to help manage COPD, the Global Initiative of Lung Disease guidelines for COPD do not recommend their use at this time. However, this innovative method of delivery should not be dismissed, but rather be improved on by designing future apps to address current limitations and

emphasize on features that have thus far been favourable. Future studies should assess the use of mobile apps and their long-term effects on clinical outcomes, including the risk for exacerbations.

### 44 ADHERENCE TO POSITIVE AIRWAY PRESSURE THERAPY

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Obstructive sleep apnea (OSA) is the most common sleep-related breathing disorder and the health, social and economic consequences of unmanaged OSA are substantial. The repetitive arousal from sleep associated with this condition has been linked to excessive daytime sleepiness, cognitive dysfunction, compromised work performance, increased risk of motor vehicle and occupational accidents, and decrement in health-related quality of life. OSA is a significant independent risk factor for several clinical consequences, including hypertension, myocardial ischemia and infarction, heart failure and type 2 diabetes mellitus.

The gold-standard therapy for the management of OSA in adults is non-invasive positive pressure therapy administered via continuous positive airway pressure (CPAP). Some patients with OSA, who have underlying significant lung disease or are unable to use CPAP, are treated with bi-level positive airway pressure (BiPAP) therapy. Adherence to positive airway pressure (PAP) therapy may be especially important in OSA patients experiencing concomitant acute and chronic disease.

Advances in Positive Airway Pressure (PAP) technology for managing sleep disordered breathing and hypoventilation syndromes have enabled healthcare providers to verify effectiveness of and adherence to therapy.

In this session, findings from a therapist driven research study that examined the relationship between PAP therapy adherence and health outcomes will be presented. Additionally, a case based approach will be used to review PAP therapy effectiveness and usage data, as well as to examine demographic, physiological, behavioral and technical factors related to adherence.

### 45 BRIDGING THE ACUTE TO CHRONIC CARE GAP

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In our current health care climate, movement of patients from an acute care setting to a chronic care facility or rehabilitation centre is becoming increasingly challenging due to the limited number of beds and a high demand for these services. The waiting time for transfer can be lengthy, and therefore there are many patients ready to be transitioned, but who remain in an acute care hospital. This is especially true for those patients with specialized needs, such as patients with a tracheostomy or those with a spinal cord injury. Since these patients require particular care and have access to only a limited number of beds, in only a few specific centres, they are often waiting extended periods of time to access a placement. Having these patients remain in acute care hospitals while awaiting transition to another facility (chronic care or rehab), means that acute care providers are faced with unique challenges in terms of their management and clinical progress.

At St. Michaels Hospital (SMH), an urban city teaching trauma hospital found in the heart of downtown Toronto, this situation is a frequent reality. As such, a respiratory therapist-led quality improvement project was developed in an effort to identify and implement strategies to minimize the gaps for these patients (tracheostomy and spinal cord injury) transitioning from acute to chronic care. Through the presentation of two case studies, the following will be discussed: the acute to chronic care gaps that were identified, the process changes that were implemented, the outcomes to date, the challenges faced with these initiatives, and areas for future improvement.

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**BLOWING SMOKE: HOW SHOULD RTS RESPOND TO MARIJUANA?****A White Markham RRT CRE CTE****Canadian Network for Respiratory Care, Caledon, ON****[AWhiteMarkham@cnrchrome.net](mailto:AWhiteMarkham@cnrchrome.net)**

While the use of medical marijuana has been legal in Canada since 2001, there have been few studies on the harms and benefits of this substance. The legalization of marijuana (cannabis) in Canada puts respiratory therapists in a position where they need to expand their cessation skills to include this product. Since individuals who use cannabis for medical or recreational reasons are part of the respiratory therapists' patient population, it is time for the profession to begin to develop strategies around its use. This session will begin with a discussion of the various types of cannabis, the methods of delivery including smoking, vaping, and ingestion, and a harm/benefit analysis of each. Participants will then examine the evidence for the use of medical marijuana, including therapeutic agents (THC & CBD), dosing, frequency etc. The session will conclude with participants collaborating on identifying and developing strategies to minimize the harms of smoking cannabis. The results of the session will be submitted for publication in the *Canadian Journal of Respiratory Therapy*.

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**MOTIVATIONAL INTERVIEWING: WHAT IS YOUR MOTIVATION?****A Ladd Med RRT FCSRT CRE CTE CTTS****Thompson Rivers University, Kamloops, BC****[aladd@tru.ca](mailto:aladd@tru.ca)**

The goal of this presentation is to inform educators and practitioners of all experience levels in the guiding principles, strategies, and skills for incorporating Miller and Rollnik's motivational interviewing (MI) techniques into their practice. Essentially, MI is a form of collaborative conversation for strengthening a client's motivation and commitment to change. Now if you are thinking "Yawn...this is boring"—stop right there! Sure, MI consists of a set of empirically validated counseling techniques designed to support client-centered work for addressing the common problem of ambivalence about change by paying particular attention to the language of change. But that doesn't mean it has to be boring! Through the use of images, music, and video, along with real life personal experience, we will explore our personal motivation to educating and assisting our clients. We will learn how to apply the spirit and foundational skill of MI in practical ways at home, in the workplace, and with our clients. The great big wild world of motivational interviewing is massive and expansive; therefore, rather than attempt to make you drink out of a fire hose of information we will pour a glass of the finest, and focus on a few key components.

**ANESTHESIA ASSISTANTS**

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**SURGICAL PATIENT ENGAGEMENT: A WONDER DRUG?****P Nellis BSc RRT CCAA****Partnered Healthcare Inc, Georgetown, ON****[patrick.nellis@readyformsurgery.com](mailto:patrick.nellis@readyformsurgery.com)**

There is a growing body of evidence suggesting that patients who understand their role and actively manage their health and healthcare have better outcomes. While studies indicate that most people want to be involved and informed, healthcare institutions are challenged to support patients toward meaningful engagement.

New definitions have emerged in the literature related to patient and family engagement. Patient 'activation' has been defined as those who have the knowledge, skills and confidence to manage their own care. Achieving this level of engagement may be more reasonably attained by offering patients an educational pathway to follow. Such a pathway—or framework—may be more effective than conventional methods in guiding patients to an understanding of their role and the actions they can take to optimize their outcome. This may also enable the type of patient partnerships that are commonly desired by healthcare institutions.

Such a change would require a shift in the patient-provider relationship, including expectations of both. As such, this necessitates guidance and support of patients, healthcare providers and leaders alike. The presenter has explored this concept through the development of a novel surgical patient engagement program entitled *Ready for My Surgery*.

This program is designed to begin supporting surgical patient engagement immediately following the booking of a surgical procedure. Taking advantage of the period of time ahead of surgery, patients are gradually introduced to important concepts. This approach offers a contrast to conventional patient education where large amounts of information are often introduced during a small number of visits to healthcare institutions.

Taking advantage of modern digital technologies, the information provided via the *Ready for My Surgery* program is personal, accessible, offers different media for information consumption and aims to guide patients toward empowerment. Both patients and healthcare providers can experience and offer feedback on the program by visiting: [www.readyformsurgery.com](http://www.readyformsurgery.com)

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**LES OPIACÉS EN ANESTHÉSIE, BIEN OU MAL?****G Petit inh****CISSS Abitibi-Témiscamingue, QC****[guillaume\\_petit@ssss.gouv.qc.ca](mailto:guillaume_petit@ssss.gouv.qc.ca)**

Dans les dernières années, plusieurs études tendent à démontrer que les opiacés ont à la fois un effet analgésique mais aussi un effet hyperalgésique. Certains travaux expérimentaux pointent du doigt les narcotiques, à tel point que quelques anesthésiologistes tendent à ne plus les utiliser lors d'une anesthésie générale afin d'éviter de causer une hyperalgésie chez leurs patients. Après une discussion très intéressante avec un anesthésiologiste de mon centre, je me suis interrogé si on pouvait vraiment éliminer les opiacés de l'arsenal pharmacologique en anesthésie? Pour répondre à cette question il faut s'en poser plusieurs autres : Comment fonctionne cette classe de médicament? Est-ce que tous les opiacés sont aussi fautifs? Peut-on utiliser des médicaments non-opiacés pour obtenir un soulagement suffisant pour le patient? Est-il possible de faire une anesthésie générale ou même régionale sans aucun opiacés? J'ai donc décidé de fouiller le sujet plus en profondeur et je viens vous présenter les résultats de ma recherche.

Afin de bien répondre à toutes ces questions, je réviserai la pharmacodynamique des opiacés ainsi que des autres classes de médicament qui peuvent permettre d'éliminer ou de diminuer l'utilisation de ces derniers. Ensuite, je m'assurerai de mettre en lumière le phénomène d'hyperalgésie afin de bien comprendre l'origine de ce mouvement contre les narcotiques. Lorsque ces concepts seront maîtrisés nous pourrions ensuite analyser si des changements dans la pratiques pourraient être bénéfiques pour les patients. De quoi avoir de belles discussions avec vos anesthésiologistes à votre retour dans vos centres respectifs.

De plus, comme la présentation a lieu dans une autre province que celle où j'exerce ma profession et que des inhalothérapeutes/thérapeutes respiratoire de tout le pays y seront présents, il sera intéressant de comparer les différentes pratiques en lien avec les narcotiques dans chacun de vos milieux.

**50**  
**AWAKE CRANIOTOMY: EVOLUTION OF NEUROSURGICAL PROCEDURE AND ANESTHESIA TECHNIQUES**

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Introduced by Penfield in the 1930s, awake craniotomy has changed over the years from a surgical and anesthesia perspective. Initially considered safer than undergoing general anesthesia, it was used mainly for epilepsy surgery and occasionally for brain tumour resection. Improvement in neuroanesthesia and the introduction of intra-operative neuromonitoring expanded the use of craniotomy under general anesthesia for resection of brain tumours. Awake craniotomy was still the only safe approach for resection of tumours located close to the speech centre. In the last five to ten years, there has been a shift to do more brain tumour surgery while the patient is awake, regardless of whether the tumour is located in the "eloquent" area or not. In this presentation we are discussing the advantages of awake craniotomy over the procedures done under general anesthesia. We will look at different anesthesia approaches and limitations of different techniques. The essential role of anesthesia assistants in the implementation of this procedure will be discussed.

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**EMERGENCE DELIRIUM: CAUSATION, CORRELATION AND IMPROVEMENTS NEEDED**

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Emergence Delirium is a common complication often seen in the post-anesthetic care unit and is poorly understood as well as poorly managed. Often confused with delirium found in the Intensive Care Unit, Emergence Delirium lacks a clear differentiation clinically and is often not even recognized. Due to its significant impact on postoperative care, employees, and patient well-being, there is a need for more specialized studies to be conducted on its etiology. Not only are there patient-associated impacts, there are also increased hospital-associated costs, longer duration of stay, and more staff being implemented in patient management. Attending healthcare providers need to be made aware of the condition and current research in relation to risk factors, diagnosis, and current treatment options. Associated risk factors that have been seen to increase the incidence of Emergence Delirium are the extreme spectrums of age, the presence of preoperative anxiety, particular anesthetic techniques, specific surgical procedures, and poor postoperative pain management. The high need for further research will also be touched on as the condition has a significant impact on the course of patient care and hospital resources. Emergence Delirium contributes to a delayed recovery process, resulting in longer lengths of stay, more resource utilization, higher hospital costs and more staff needed for patient management. The lack of a specific quantification process and measurement tools make recognition of Emergence Delirium under-recognized and undermanaged. A single, direct cause of Emergence Delirium still remains unknown, and further research needs to be conducted in regards to compiling a specific scale and protocol to follow in the postoperative process.

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**TOPICALIZATION TECHNIQUE FOR AN AWAKE FIBEROPTIC BRONCHOSCOPE INTUBATION**

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**BACKGROUND:** Intubating a patient with a difficult airway is a major concern for anesthesiologists and anesthesia assistants. For a class 4 airway, an awake fiberoptic intubation is the most common technique and abolishing the cough and gag reflexes of the upper airway, vocal cords, and carina is required.

**OBJECTIVES:** To describe one approach used to topicalize a patient's airway in preparation for an awake fiberoptic intubation that produces total abolishment of the cough and gag reflexes.

**METHODS:** Conscious sedation with dexmedetomidine infusion and oxygen via nasal prongs, 4% lidocaine administered via EZ sprayer and tonsil gauze, 5% xylocaine ointment, 2% viscous lidocaine.

**RESULTS:** Improved patient compliance, satisfaction, and decreased time to fully topicalize the patient's airway.

**DISCUSSION:** Past practices, problems with previous practices (inadequate Topicalization, time consuming, decreased patient satisfaction/trauma) and lidocaine toxicity will be discussed.

**CONCLUSION:** This technique has shown to improve topicalization, improve efficiency, and increase patient satisfaction. This revised technique was brought to my OR following the return of an anesthesiologist after completing a difficult airway Fellowship with Dr. Orlando Hung, a world-renowned anesthesiologist and co-author of "Management of the Difficult and Failed Airway".

**53**  
**CHALLENGES IN THE OR: CUTTING THE ENDOTRACHEAL TUBE**

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The setup and practices of equipment changes from person to person, from what generation one was trained, or even where they were trained or who they were trained by. Having a background in the field of respiratory therapy can have an influence on certain practices the physicians may overlook. Over the course of someone's career, particular situations or instances can change how one might look at that same situation if it were to happen again in the future. Learning from your mistakes or from somebody else's can help others from making a potentially costly error. Many anesthetists are set on doing their practice the way they were taught, and it is hard to break them of any habits or routines that have got them to where they are now. Airway management is one of the most crucial areas that anesthesia assistants are a part of, and some of the topics in this discussion can help make airway management easier when it come to understanding the fundamentals of the endotracheal tube. The endotracheal tube has not changed much in the past 30 years, but the tools associated with inserting it and the adjunct equipment that has been developed sure have changed and changed practices. Now there may be some practitioners that are already on the "cut the tube" bandwagon, but there are a lot that are not. Without listing all of the points out here, this topic will look at patient positioning, ventilation, difficult airway management, CO<sub>2</sub> measurements, basic endotracheal tube characteristics and a few more.