EDITOR’S MESSAGE
The road ahead for respiratory therapy

RESEARCH ARTICLE
A comparison of three techniques for cricothyrotomy on a manikin

NARRATIVE REVIEW ARTICLE
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The Canadian Society of Respiratory Therapists provides national leadership through advocacy, service and unity to respiratory therapists in Canada. Established in 1964 as the Canadian Society of Inhalation Therapy Technicians, the CSRT is the national professional association that represents over 3500 respiratory therapists across Canada and promotes exemplary standards of practice, conduct and performance in the provision of respiratory care. The CSRT is also the credentialing body for RTs who practice in non-regulated jurisdictions and administers the accreditation process for respiratory therapy education programs. For more information, please visit: www.csrt.com

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The road ahead for respiratory therapy

Andrew West, EdD(c), RRT, FCSRT

It only takes viewing a brief segment of the evening news on any given day to get a sense that, when it comes to the broader context in which we practice, the only constant is that it is ever in flux. Recent headlines have touched on such events as borderless health emergencies, disruptive technologies, stories of refugees fleeing crises that reach around the globe, and political agreements in Canada that promise to ensure a robust health care system into the future. The practices that respiratory therapists engage in are truly products of complex webs of influential factors, including those that we see in these and other news headlines [1]. Some of the influences that shape us may be ones we interact with routinely; however, others may at times seem to lie far outside of our sphere of influence [1].

To support achievement of a vision to provide the highest levels of patient care, the Canadian Society of Respiratory Therapy (CSRT) developed its blueprint for respiratory therapy to guide future directions in the profession. To remain aligned with the health needs of Canadians, the CSRT noted that the profession will need to respond to multiple pressures that include: evolving funding models, changing patient needs, new technologies, and demographic shifts [2]. This begs the question: In the face of such wide pressures, what are the most effective and responsible ways for us to achieve this vision? Furthermore, how can we begin to play a greater role in actually shaping those factors that, in turn, shape our practices?

As we acknowledge and embrace our profession’s place within a broad and fluid context, we need to consciously consider how we want to move forward. A recent study by our colleagues in the United States highlights some of the perceptions that exist in the profession with respect to its viability. In particular, the importance of skills that support autonomous practice, the expansion of practice roles, and heightened respect to its viability. In particular, the importance of skills that support autonomous practice, the expansion of practice roles, and heightened respect to its viability. These perceptions are echoed by those addressed in the CSRT’s Blueprint for the Profession, and I am certain have characterized many national stakeholder group discussions, not to mention colleagues gathered around the water cooler. Previously, I have also called for exploration of emerging areas of practice opportunities and the adoption of expanded paradigms of practice in respiratory therapy [4]. In this case, I encouraged that public health and population-based approaches to health could augment the respiratory therapist’s role in addressing many of the growing respiratory health-related challenges we now face. This is but one road we may decide to pursue as we move forward. Secure in knowing we are surefooted in our professional identity and history, how we chose to approach to the challenges we are faced with as a profession is critical and warrants careful reflection.

The current issue of the CJRT includes abstracts of conference proceedings from the upcoming 2017 CSRT annual education forum. These proceedings offer a glimpse of the issues to be discussed at the conference and, importantly, they serve as a snapshot of the practices, emerging knowledge, perceptions, and pressures that are shaping our profession.

You will also see that the CJRT has implemented a call for contributions to a special issue on primary care in respiratory therapy (deadline for submission is February 1, 2018). In recognition of the important role that primary care plays in our health care system, the special issue will be an acknowledgement of the momentum occurring in respiratory therapy relative to primary care practice, and to the rich achievements it is realizing. I encourage you to join in the discourse that can shape our profession by reflecting on, and sharing, your own experiences.

Andrew West, EdD(c), RRT, FCSRT, Editor-in-Chief

REFERENCES


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A comparison of three techniques for cricothyrotomy on a manikin

Oliver Poole RRT MD (candidate)\textsuperscript{1}, Michael Vargo MD\textsuperscript{1}, JinBin Zhang MD\textsuperscript{2}, Orlando Hung MD\textsuperscript{1}


**Background:** Cricothyrotomy can either be performed by an “open” cricothyrotomy technique, or by a needle (Seldinger) technique. Clinical uncertainty exists regarding which technique is more effective. We compared three different techniques for cricothyrotomy, performed by anesthesiologists on a manikin.

**Methods:** The techniques studied include an open surgical technique, the Melker Cricothyrotomy kit (Cook), and the Portex Cricothyroidotomy Kit (Smiths Medical). Participants were randomized to the order they performed each technique. Each procedure was videotaped and the time to first ventilation recorded. The participants completed a 10-point scale following the performance of all techniques to assess the subjective level of difficulty of each technique and to indicate which technique they would prefer in a real clinical CICO scenario.

**Results:** Mean time to ventilation was significantly faster with the surgical cricothyrotomy technique, when compared with both the Portex and Melker techniques (Mean difference: Portex-surgical = 18 s, 95% CI (1, 36) and Melker-surgical = 42 s, 95% CI (31, 54)). The Portex technique was significantly faster than the Melker technique (Melker-Portex = 24 s, 95% CI (11, 37)). Six of the 11 (55%) participants preferred the Melker procedure, four (36%) preferred the surgical procedure, and only one anesthesiologist (9%) preferred the Portex procedure.

**Discussion:** The surgical technique was faster than both the Portex and Melker techniques. The surgical technique was also more successful than the Melker technique. The preferred technique among the participants was the Melker technique, despite being the slowest, least successful, and rated most difficult by participants and observers. This suggests that although the surgical technique may not be preferred by many airway practitioners, it has been shown to be the most likely technique to achieve the primary goal of the procedure: establishing oxygenation and preventing death.

**Implication statement:** This research examines three techniques for cricothyrotomy in the “Can’t Intubate, Can’t Oxygenate” scenario. Our data, as well as data from other studies, suggest that a practice shift towards a surgical technique, and away from needle based techniques, may be warranted.

**Key Words:** airway management; emergency; cricothyrotomy; manikin; surgical airway

**INTRODUCTION**

Significant respiratory adverse events are associated with difficulty in airway management [1–4]. It is imperative that an airway practitioner is able to perform a surgical airway. Oxygenation and ventilation can generally be provided by one of four methods: through bag-mask-ventilation, through an extraglottic device (e.g., laryngeal mask airway), through an endotracheal tube, and if everything else fails through a surgical airway [5]. A surgical airway in the “Can’t Intubate, Can’t Oxygenate” (CICO) scenario can be accomplished by tracheotomy (typically performed by a surgeon) or by cricothyrotomy (commonly performed by non-surgical practitioners such as anesthesiologists or emergency physicians).

Cricothyrotomy can either be performed by an “open” cricothyrotomy technique or by a needle (Seldinger) cricothyrotomy technique.

Clinical uncertainty exists regarding which technique is more effective. An open surgical technique has been reported to be faster and more successful in several studies [6–12], while others showed no difference [13, 14] or that a needle-guided technique is faster or more successful [15, 16]. Interestingly, in several studies where the surgical technique was shown to be faster, participants preferred a needle technique [10, 13]. The Seldinger technique has been shown to be the preferred technique by anesthesiologists practitioners [17].

According to the Fourth National Audit Project audit, anesthesiologists failed to secure a surgical airway in 16 out of 25 attempts (64%) [3]. In this study, we compare three different techniques for cricothyrotomy performed by attending anesthesiologists on a manikin. Our primary outcome measure was time to ventilation, as we feel this best predicts the ability of the given procedure to advance the ultimate goals of establishing oxygenation and preventing death.

**MATERIALS AND METHODS**

We obtained research ethics board approval at Nova Scotia Health Authority in Halifax in July of 2014. After providing consent, staff anesthesiologists performed three cricothyrotomies on a manikin. The three techniques studied include an open surgical technique (scalpel, trousseau dilator, endotracheal tube), the Melker Cricothyrotomy kit (Cook Medical, Bloomington, IN), and the Portex Cricothyroidotomy Kit (Smiths Medical, Dublin, OH).

The open surgical technique consisted of palpating the cricothyroid membrane (CTM), making a vertical incision over the CTM, dilating the CTM with the trousseau dilator, and then inserting the endotracheal tube. A trach hook was not used as participants did not have an assistant available to hold it. The Melker kit was used by filling the syringe with 2 mL of saline. The needle was inserted perpendicularly across the CTM until air was aspirated. The needle was directed caudad at a 45-degree angle as the guidewire was inserted. The airway and dilator were advanced over the guidewire follow by removal of the dilator.

The Portex kit was used by first locating the CTM and then making a horizontal incision in the skin to facilitate insertion of the device. The Veress needle, dilator, and cricothyrotomy tube were inserted perpendicularly to the CTM until the needle indicator disappeared. This indicated entry into the trachea. The airway was advanced further until the needle indicator appeared again, which indicated contact with the posterior tracheal wall. The device was then directed caudad and advanced a further 1–2 cm. The needle was removed and the airway advanced over the dilator.

We used the Laerdal SimMan manikin (Laerdal Medical Canada, Ltd. Toronto, ON) because it was available at our institution (the Queen

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Elizabeth II Atlantic Health Training and Simulation Centre) and was used in a previous surgical airway simulation study [17]. The artificial skin that covers the site of the cricothyrotomy was replaced between each procedure.

Participants watched a standardized 20-minute instructional video demonstrating each of the three cricothyrotomy techniques. The participants were not allowed to practice any of the techniques prior to participation. The cricothyrotomy kit needed for the technique was opened but not assembled at the beginning of each procedure. The participants were randomized to the order they performed each technique by choosing a sealed envelope.

Following completion of each intubation, an investigator inspected the manikin with a bronchoscope and recorded the position of the airway device and any trauma to the manikin. Success was defined as the airway device being successfully inserted into the trachea, without trauma to the manikin. We specified no upper limit of time to perform the procedure in our definition of success. The participants completed a 10-point scale following the performance of all techniques to assess the subjective level of difficulty of each technique and to indicate which technique they would prefer in a real clinical CICO scenario.

Each procedure was videotaped. Two independent investigators reviewed the videos, and recorded the time to first ventilation which was defined as the time from initial skin puncture or incision to first ventilation. The rationale for these time points is that our goal was to examine the difference between procedural techniques, which would be confounded if we included the time it took various practitioners to assemble the necessary equipment.

Power analysis for pairwise comparisons indicated that 30 cricothyrotomies were needed to detect a mean difference of 30 s between techniques with a standard deviation of 25 s [8], an alpha value of 0.05 and power of 0.80.

Inter-rater reliability across the two observers coding time to ventilation was assessed using absolute agreement intraclass correlations (ICCs) [18]. Hypotheses were tested using generalized estimating equations (GEEs). In the present analysis, we specified a gamma distribution with a log link to account for positive skewness, robust estimates of standard errors using the Huber–White sandwich estimator, and an unstructured covariance matrix. In these models, type of procedure (Portex, Melker, or surgical) was entered as a categorical predictor of outcomes.

**RESULTS**

Twelve staff anesthesiologists participated in this study. The mean number of years practicing as a staff anesthesiologist was 10. One participant had performed a cricothyrotomy in a real CICO scenario in the past. The data from one participant was removed from the analysis due to improper preparation of the manikin resulting in an outlying data point.

The data from our study, and other similar studies, suggest the need to consider a change in practice in cricothyrotomy to move away from needle-based techniques in favour of surgical techniques. Emergency cricothyrotomy is rarely performed by airway practitioners and the continued improvement of technical skills with airway adjuncts in difficult airway management will not likely improve the efficacy of cricothyrotomy in the practice of airway management [19]. Only 1 of the 11 anesthesia staff in our study had performed a cricothyrotomy in their careers using the Melker kit. It is challenging to choose the best technique for a procedure that is rarely performed. In our opinion, it is difficult to support the

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**DISCUSSION**

Our data showed that the surgical technique was faster than both the Portex and Melker techniques. The surgical technique was also more successful than the Melker technique. This is consistent with data from other similar studies [6–12]. The preferred technique among the participants was the Melker technique, despite it being the slowest, least successful, and rated as most difficult by participants and observers. This is likely due to pre-existing familiarity with Seldinger-based procedural techniques by the anesthesia practitioners [17].

The data from our study, and other similar studies, suggest the need to consider a change in practice in cricothyrotomy to move away from needle-based techniques in favour of surgical techniques. Emergency cricothyrotomy is rarely performed by airway practitioners and the continued improvement of technical skills with airway adjuncts in difficult airway management will not likely improve the efficacy of cricothyrotomy in the practice of airway management [19]. Only 1 of the 11 anesthesia staff in our study had performed a cricothyrotomy in their careers using the Melker kit. It is challenging to choose the best technique for a procedure that is rarely performed. In our opinion, it is difficult to support the
individual preference of technique. We question how one would come to determine what is best in their hands given the rarity of clinical exposure to the techniques, as well as the lack of formal training and opportunity to practice various techniques. A technique that is successful on a manikin or cadaver may not work on a patient.

In the observational study reported by Lockey et al. [20], the investigators presented a large dataset of physician-led prehospital advanced airway management with a standard operating procedure. When a single best-look direct laryngoscopy attempt failed an extraglottic device (iGel, Intersurgical, UK) would be placed, and if the extraglottic device failed a surgical cricothyrotomy technique would be performed. All surgical cricothyrotomies were successful. While not directly applicable to the operating room setting, the fact that nonanesthetist practitioners were able to achieve a 100% success rate in the CICO scenario using the surgical technique, something that has not been demonstrated with needle-based techniques [4], even in a low-fidelity simulation setting, is impressive. This suggests that while the surgical technique may not be preferred by many anesthesia practitioners, it has been consistently shown to be the most successful technique to achieve the primary goals of the procedure: establishing oxygenation and preventing death.

Needle-based techniques require that airway practitioners accurately locate the CTM by palpating surface landmarks. This can be very difficult in those with distorted neck anatomy or obesity. These types of patients are more likely to be difficult to intubate and require a cricothyrotomy. Studies suggest that anesthesiologists are unable to accurately locate the CTM the majority of the time, particularly in obese and female patients [21, 22].

There were limitations to our study. The sample size is small, affecting the power of the data. Larger scale studies and studies utilizing other airway simulators are required to confirm the findings of this study. The study manikin was changed during the study, as there was significant damage to the posterior tracheal wall as a result of one of the procedures with the Melker device. This created a false passage and would likely affect subsequent cricothyrotomy procedures. The need to change the manikin during the study impacts the standardization of the procedures for all participants. It is unlikely that the need to change the manikin significantly impacted the final data analysis. It is unknown how transferable data collected on manikins is to real clinical practice. A technique that is effective on a manikin may not be effective in a real CICO situation. Our study did not investigate all commercially available techniques for cricothyrotomy, nor did it investigate any modified techniques that could be employed in a real situation.

The limitations we experienced with a manikin model suggest that the development of a cost-effective and realistic model for cricothyrotomy training is needed. Wong et al. [23] found that when learning the skill, cricothyrotomy should be performed five times to achieve a reasonable success rate. The cost of five cadavers would be prohibitive to many institutions. However, damage to a manikin that requires it to be replaced is undesirable and a disposable biologic model may be the appropriate compromise as described by Cho et al. [24].

In conclusion, our results demonstrate that open cricothyrotomy provides more rapid airway access and comparable success when compared with needle access methods, despite less familiarity with the open technique among our participants. Larger scale studies and meta-analyses of existing data are needed to further examine various techniques for cricothyrotomy in the CICO scenario. Based on the results of this study, and various other studies on the topic, we feel it warranted that airway training courses emphasize the open technique as a primary technique.

DISCLOSURES
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INTRODUCTION

Respiratory therapists (RTs) work in all clinical areas of the hospital and through all spans of the lifespan, from helping a new baby take its first lungful of air to providing ventilation to those who cannot manage on their own. While compassionately helping patients take their last breath. It is not uncommon for all of these feats to occur within a single shift. RTs possess a vast amount of knowledge, skills, and abilities to provide a comprehensive range of therapeutic and diagnostic procedures. They also work closely with physicians and other healthcare staff to develop and carry out complex therapies and individual patient care plans [1].

The current state of hospital redevelopment

Over the last 10 years in Ontario, there have been 34 major healthcare redevelopment projects completed. There are 13 major projects presently in progress in 2017, with many more on the horizon [2]. It is not just the bricks and mortar changes that healthcare professionals face during new builds and renovations but also significant modifications of geography and accompanying technology and equipment. These changes can have a significant impact on day-to-day processes and workflow. Additionally, hospital redevelopment can be seen as an opportunity to implement better practices. Operational readiness is a process that ensures the working environment is prepared to effectively support and accept the changes resulting from the physical changes produced by the hospital redevelopment project [3].

The building of a new facility or renovations of an existing building require and carry out complex therapies and individual patient care plans [1]. Rehabilitation projects are prepared to effectively support and accept the changes resulting from the physical changes produced by the hospital redevelopment project [3].

Impact to respiratory therapy practice

Hospital redevelopment should be multidisciplinary to identify unique hospital requirements and to provide direction to staff and physicians affected by the changes. Representatives from all healthcare professions should be at the table when decisions are made, particularly when alterations in process directly impact patient care. The distinctive contribution of RTs includes clinical and technical knowledge that is integral to the transformations that accompany hospital redevelopment. The purpose of this paper will be to describe the value of the RT during hospital redevelopment as a distinctive resource for clinical and technical information, as an essential stakeholder in the capital redevelopment planning and operational readiness phases, and as a vital change agent with strong leadership skills and change management capabilities.

The role of the RT in capital redevelopment planning

There are five different phases involved in capital redevelopment projects in Ontario: submitting the project proposal to the Ministry of Health and Long-Term Care (MOHLTC), development of the functional program, building of the output specifications, creating the request for proposal (RFP), and the construction phase [4]. Given their clinical and technical expertise, RTs can play a significant role throughout several phases of the capital planning stages. RTs are excellent at troubleshooting, problem-solving, and critical thinking. These attributes, as well as being accustomed to complex and ambiguous situations, can be invaluable throughout the many facets of redevelopment planning.

Project proposal submission

The project proposal is a comprehensive report to the MOHLTC that lays the groundwork the capital redevelopment project including estimated costs, site and building plans, a fundraising strategy, and other operational issues [4]. The development of the first-stage submission requires extensive planning expertise and the contributions of both internal and external stakeholders to capture the interplay between program and service elements and physical and cost elements [4]. The engagement of RTs in these activities from the earliest stages is necessary to ensure key complex medical workflows and process changes are optimized in the project plans. Since RTs work in all areas of the hospital, cover multiple areas of the hospital at a time, and must move rapidly between these areas, they have practical insight into design features that allow for improved efficiency and patient safety. RTs are one of the few health-care professionals that can speak to the interconnectivity of departments and interdependency of programs and services. RT involvement at the proposal stage can also help minimize costly change orders or omissions that need to be rectified at later stages in the project.

Development of the functional program

The functional program projects services, patient volumes, and patient needs in the future and outlines projected staffing, space requirements, and department adjacencies that will be incorporated into the design of the new space [4]. Given the tremendous clinical skillset of the RT, they can become an extensive resource when designing the physical requirements of intensive care units (ICUs), operating rooms (ORs), trauma and emergency department (ED) bays, special care nurseries, and general patient rooms. These abilities position RTs to be consulted when developing new workflows or altering existing ones to fit into a new space. Architectural and design teams possess the industry standards...
content but RTs can provide insight into some of the clinical design features and adjacencies that should be included in the functional program document. One such vision is the location of an RT department within the ICU to optimize their accessibility to the sickest patients. Since RTs tend to cross-cover other areas of the hospital, it would be ideal for RT departments to also be adjacent to all of the units that they work in. Additionally, understanding of the usage of critical equipment such as ventilators and procedure carts in relation to these spaces can be of value in creating a room that is functional and allows for efficiency, effectiveness, and delivery of safe patient care. RTs are typically members of the code response teams and can give valuable input during emergency preparedness planning. Often the importance and merit of RTs is underestimated and respiratory caregivers are eliminated from decision-making processes; RTs need to remember that they are the only profession specially trained to perform respiratory care modalities and their unique and resourceful opinions have the potential to change patient outcomes and decrease hospital length of stay [5].

Building Project-Specific Output Specifications

The Project-Specific Output Specifications (PSOS) document generates a list of criteria and standard features that must incorporate into the design of the new space [6]. This can include features such as the height of hand-washing sinks, the location of air outlets and vents, the kinds of paint or surfaces that are to be used in patient rooms, the steel used for framing, and the locations and adjacencies of the various departments [6]. RTs are vital advisors into the design features of many workspaces including the locations on articulating arms and headwalls. For example, considering RT knowledge of both the anesthesia and neonatal roles, along with nursing and physician input, the optimal design of a C-section OR can be determined. An RT will have insight in to the workspace needed for the anesthetist when caring for the mother such as the location of the anesthetic gas machine, anesthesia workspace, and equipment needed for an airway or hemodynamic emergency. They will also understand the workflow of those caring for the baby including the pathway from the surgical table to the radiant warmer and the locations of headwalls and resuscitation equipment that should be on hand. Conditions that contribute to patient- and family-centered care such as the presence of family in the OR as well as staff and patient workflow are all design concepts that RTs can provide insight into during the development of the PSOS.

Creating the RFP

In this stage, the healthcare facility and Infrastructure Ontario will first release a Request for Qualifications to shortlist the pool of candidates to three developers to ensure the project team has the required experience and track record to complete capital project on time and on budget [6]. The three shortlisted candidates will then proceed to respond to an RFP while meeting all the criteria outlined in the PSOS from Stage 3 when designing the new hospital [6]. During the RFP stage, the role of the RT can include providing input alongside other frontline healthcare professionals and the project team on the responses from the various builders and assessing how well they meet the specifications outlined in the PSOS. They can also participate in the scoring process and ultimately towards the selection of the winning bid.

Construction phase

During the construction phase, the opportunity to view new areas while still in production can not only flag any potential problems, but also help prepare for operational readiness activities. For example, touring the unfinished ICU space and noticing that the transport of a patient from the OR on an ICU bed must occur through a very narrow doorway can indicate that an alternate route needs to be established or a change in process must occur (e.g., the patient can be transported on a stretcher instead of a larger bed). Realizing the magnitude of change that needs to occur during the construction phase based on the physical space may evoke the need for alterations in process to occur in the present space. Implementing change early and transferring these new processes to the new areas can help avoid bombarding staff with change all at once. After substantial completion of a redevelopment project, pre- and postoccupancy inspections occur as a means of exposing any deficiencies in the design or building of the new spaces. Sometimes flaws in the functionality of a space are not apparent until clinicians are able to tour the completed physical location. Errors and omissions in the building design, as well as in the presence and functioning of in-contract specifications that affect RT practice, should also be inspected from an RT perspective.

Operational readiness

Operational readiness ensures that on opening day patient care and services are delivered by the right people, at the right place, at the right time, with the right equipment and technology, and in accordance with the right policies and protocols [7]. Additionally, operational readiness activities form the living half of the project. This may include redesigned models of patient care and workflow, a human resources plan, information-technology strategies and implementation, opening day definition and ramp down and up tactics, financial plans and operating budgets, stakeholder relations and expectations, internal and external communications, and orientation and training plans [7]. RTs can be a vital part of these processes. While the focus on early implementation of new processes and equipment in existing spaces should be in place, this is not always possible due to geography or inaccessibility of equipment. Involvement of RTs from the earliest stages of the project including operational readiness activities can help mitigate some of the change pressures associated with capital redevelopment projects.

Although the RT profession has evolved from being a highly technical vocation to one that is predominantly clinical, RTs are still revered for their expert knowledge of respiratory and anesthesia equipment as well as their ability to troubleshoot complex medical devices. Technical skills such as medical gas outlet repair and maintenance and repair of equipment such as flow meters, suction regulators, ventilators, anesthetic gas machines, and blood gas analyzers continue to be components of RT occupational profiles [1]. RT expertise of medical gas systems can be essential to planning the locations and configurations of articulating arms and headwalls across the hospital as well as the quantities of medical gas outlets and configurations based on workflows within each space and the connectivity of respiratory equipment to respiratory interfaces. The merging of clinical skill and technical applications during patient care is a unique area of expertise. For example, management of the technical demands associated with patient transport and independent travel during in house and external (land and air) transport is often managed by RTs along with the application of clinical skills to support the patient [1]. This is important to consider when planning the flow of patients within and outside of a new facility. As well, RT knowledge of Department of Transportation regulations for the safe transport and handling of medical gas cylinders is an important consideration when planning equipment and patient moves to a new facility or space [8].

The technical capabilities of RTs also make them valuable resources to be involved in the procurement of equipment such as ventilators and anesthetic gas machines that are complex and specific. Mechanical devices such as suction regulators, flow meters, and airway adjuncts that are required for numerous areas of the hospital should also be obtained through consultation with RTs to ensure the proper devices are being procured for a particular situation. RTs can play a significant role throughout the equipment RFP process. From developing the specifications to facilitating and performing the clinical trials, RTs are absolutely required to ensure the equipment selected is not only optimal for patient use but also user friendly. They can also contribute during negotiation processes where consumables, interfaces, training and orientation of staff by the vendor, technical support, and service contracts are often discussed as part of the entire package.

The burn-in phase is the process by which components of a system are exercised prior to being placed in service with the objective of forcing certain failures to occur under supervised conditions so an understanding of capacity of the space can be established [9]. During this phase, new clinical spaces are set up with the required equipment and supplies.

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Workflows and new processes are mapped and tested then appropriate changes are made based on feedback from staff. Day-in-the-life scenarios or pilot units involve simulation of patient care in the actual space. These scenarios use the actual equipment, supplies, and personnel involved in a real situation and can be completed to determine the optimal routes for patients and staff to travel, separation of clean and dirty supplies to prevent cross-contamination, and for emergency preparedness exercises. RTs should be included in these multidisciplinary exercises as they are often involved in the real-life emergent care. Much of the complex respiratory and anesthesia equipment requires expert knowledge to setup, configure, and integrate with other systems. Technical acceptance checklists and validation of proper functioning may also need to be completed before new equipment is accepted from the vendor; clinical acceptance is to be completed once equipment is used on patients.

Finally, RTs can play an important role during the training and orientation phases of operational readiness. Corporate orientation can provide the generic preparation needed by all staff such as standard building operating procedures, general wayfinding, and corporate policies and procedures. Clinical staff will also require orientation to their specific new patient care areas, equipment, and clinical processes. At the department level, staff should be orientated to their own unique spaces and for RTs this can include several different areas of the hospital. Therefore, RTs require a unique orientation program designed to ensure staff are familiar with the entire footprint of the new building including patient rooms, supply rooms, team stations, medication rooms, stairwells, and code response routes. RTs can be an excellent resource to assist in the orientation and training of other staff with regards to way-finding, mock code simulations, and respiratory and anesthesia equipment use and set-up. RTs can also be trained as "super-users" by equipment vendors as a means to implement "train-the-trainer" models where staff provides the majority of training to the end-users either on the job or in protected time. RTs perform educational duties on a daily basis, whether it is teaching a new healthcare professional to suction a patient or teaching a family member how to hold an intubated baby, they possess the skills to teach others effectively [5].

Overall, clinical and technical skillsets of RTs can make them an important contributor to the operational readiness activities that must be performed to get a new facility ready for opening day. RTs need to be given the opportunity to participate in these activities to not only ensure RTs are well prepared but also other healthcare professionals. An interdisciplinary approach is essential to ensure all the bases are covered for all staff.

Change management and leadership

Over the past 20 years in the RT profession, there has been movement away from a technical focus towards clinical skills. However, the progression of RTs into nontraditional positions remains an avenue less pursued. Consequently, opportunities to become involved in roles such as those required for hospital redevelopment are not considered by many RTs or hospital administrators. The RT profession should strive to become involved in redevelopment projects and take the initiative to pursue education in leadership, process improvement, and change management to perform optimally in these positions. RT managers should encourage staff to pursue these professional development opportunities alongside clinical and technical training that is essential to the RT role.

One of the primary barriers to successful hospital change initiatives is failing to create buy-in or ownership of a change enterprise [10]. Communicating a solid vision to front-line staff regarding the necessity of the upcoming transition so that it is known why changes are being implemented and what the desired outcomes are can facilitate commitment, empowerment, and participation in hospital redevelopment initiatives [10]. As well, hospital development provides a golden opportunity to review existing practices and establish new and innovative approaches to the delivery of patient care [11]. Due to the comprehensiveness of the RT role throughout the hospital, RTs can play a significant role during process improvement initiatives. Using philosophies that strive to implement efficient, robust orientation program designed to quickly enable as possible by identifying delays in the value chain, and working towards eliminating wastes in the system, RTs can be a key stakeholder in mapping flows of patients, staff, equipment, and supplies [12]. RTs can provide insight into the routes that are most efficient for patient transport throughout the building to support areas such as the laboratory, diagnostic imaging, and interventional radiology, as well as to and from clinical areas. They can provide input into supplies that are used during procedures such as anesthesia, difficult intubations, and arterial and central line insertions. They can develop procedure carts with the necessary equipment that are set up to mimic the logical workflows of physicians and staff so that in an emergent situation supplies can easily be found. Incorporating process improvement principles with a multidisciplinary approach has been found to facilitate problem-solving and successful implementation of day-to-day functions [12]. An example of this is involving RTs who work as anesthesia assistants (RT-AAs) in mapping out new processes for the provision of procedural sedation during cataract surgery. RT-AAs are often involved with these patients preoperatively, during their surgery, and postoperatively and will have insight into equipment used, supplies needed, and workflows of staff at each stage. Including RT-AAs with physicians, nurses, and supporting staff in process mapping can provide a more fulsome scope of the flow of the patient through the surgical program to identify tasks that add value and those that are create inefficiencies in the system.

RTs are uniquely situated to advance into what have historically been considered nontraditional leadership roles within healthcare organizations. Leadership roles such as directors, project managers, and redevelopment or transition specialists [13]. Frontline RTs demonstrate leadership in their day-to-day clinical practice as educators and patient advocates. These skills can be extrapolated to the project setting where there is great opportunity to help reshape organizational culture and focus on renewing patient-centered care [13]. At any level, when given leadership opportunities during capital redevelopment projects, RTs can empower their colleagues and other allied healthcare professionals to make important decisions and become involved in the transition process. As well, in these roles, RTs can serve as champions for RT participation from the earliest stages and throughout the entire redevelopment project. Often, there is a lack of understanding by those involved in the construction side of the project about the roles and scope of other health professional or roles outside of physicians and nursing. RTs can be advocates not only for the RT profession but also become a voice for other allied health professionals to ensure that an interdisciplinary lens is used in the planning and implementation of capital redevelopment projects.

CONCLUSIONS

RTs should be included in hospital redevelopment projects as front-line staff, managers, directors, and in specialized redevelopment or transitional roles. They are invaluable members of the project team when their unique clinical, technical, leadership, process improvement, and change management skills are utilized. Although many RTs remain at the frontline and shy away from nontraditional roles, RTs have the capability and skill to take on leading roles in hospital redevelopment. Leadership is not necessarily dependent on one’s title or one’s organizational position; it can occur at any level of an organization, and the strategy to being successful is the ability to make people want to follow [13]. As a profession, RTs need to assert these leadership skills, to participate in hospital redevelopment projects and provide their much needed expertise in large organizational changes.

REFERENCES

We are pleased to present a select number of abstracts from the proceedings of the CSRT Annual Education Conference to be held in Halifax, Nova Scotia, on May 11–13. 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 2017 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 www.csrt.com).

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

**KEYNOTE SPEAKERS**

**01 BEING TRANSGENDER**  
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Hamilton and Michaelia Elliott created this presentation that was designed to give insight on the process of transitioning for all female-to-male transgender people. They also touch on the realities associated with being transgender along with their own personal experiences through the process of transitioning. Initially, Hamilton and Michaelia spoke with high school students. Two years later, they applied for The Amazing Race Canada and were announced as Canada’s first transgender contestants. It was a goal of Hamilton and Michaelia to show the world that transgender people are the same as everyone else; they just did not have the luck of being born the right gender. Show ratings topped at 2.5 million viewers, allowing their message to be shared nationally. This led to participating in Pride parades in both Halifax and Toronto, as well as speaking opportunities at multiple universities and high schools. Today, they continue in their efforts to end the negative stigma associated with transgender people, while continuing to encourage people to value their self-worth and to be comfortable with who they are.

**PLENARY SESSIONS**

**02 CANNABIS LEGALIZATION AND ITS IMPACT ON OLDER ADULTS**  
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BACKGROUND: In the 2012 Canadian Community Health Survey, an estimated 7.5% of Canadian adults over the age of 45 reported having used cannabis in the past year. American data show that among older cannabis users, an estimated 49% have used it for 30 days or more in the past year, suggesting that although younger adults are the primary users of cannabis, a significant number of older adults use the drug non-medically as well. Yet, there is a poor understanding of older adults’ motivations for using cannabis, the intensity of their use (e.g., quantity consumed), the delivery systems they use, and the actual and perceived health implications of their cannabis use. What is clear, however, is that older adults use cannabis, and there is a need to specifically understand why and how to effectively design public health programs and messages as Canada moves to legalize non-medical cannabis in 2017.

METHODS: A narrative review of relevant epidemiologic and qualitative evidence describing the prevalence of cannabis use among older adults (defined as the baby-boom cohort and older) and the social and health implications and impact of relevance to respiratory therapists (RTs).

RESULTS: This presentation will discuss older Canadian adults’ use of a variety of cannabis products, the motives behind the choices they make concerning cannabis use for non-medical purposes, and how aging may...
change these choices. The presentation will examine the factors that influence older users’ choices to consume cannabis, and how they do so, including choices to limit the respiratory harms of cannabis use by choosing edibles or devices such as vaporizers over smoking. Older users’ perceptions of the relationship between their cannabis use and their health concerns will be discussed, as will the available evidence concerning known adverse events associated with cannabis use in older adults.

CONCLUSION: In spring 2017, Canada will introduce legislation to legalize non-medical cannabis use. This important public policy decision stands to have significant impacts for RTs and their patients, given that smoking cannabis is the most common means of consuming the drug. This presentation will focus on an often-neglected, but important, population that uses cannabis—older adults—and describe their patterns of use and motivations for using. This presentation will help RTs meaningfully and respectfully engage their patients in a discussion about the risks, benefits, and harms of cannabis use on their respiratory health.

03 PAPER TO PRACTICE: UNDERSTANDING CLINICAL RESEARCH

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Respiratory therapists (RTs) aim to provide an evidence-based practice that incorporates the best research evidence as part of patient care. The evidence must be clinically relevant and RTs must be able to critically appraise the clinical research. The number of published research articles grows each year. PubMed now has over 22 million citations and, in 2015, there were almost 1,200 articles published on acute respiratory distress. With such a large amount of research being published each year, how do you determine what research is good? What research is applicable to patients? How do you combine the research with clinical expertise to improve patient care? In this session, attendees will be given the basic understanding of what research best answers our clinical questions and understand the appraising tools, such as the number needed to treat and confidence intervals. This will assist in critically appraising research for its validity and impact. Evidence-based practice is about integrating best evidence with individual clinical expertise. This means that the evidence is to be integrated into the decision-making process of care for individuals. During this session, attendees will learn the tools along with clinical judgment to determine if the results of clinical research are clinically important and if the results could be replicated in your practice. RTs need to use both individual clinical expertise and the best available evidence, and neither alone is enough. With the right tools and understanding, busy RTs can devote some of their scarce reading time to selective, patient-driven appraisal and incorporate the best available evidence into their practice.

04 THE RT COURTROOM SURVIVAL GUIDE

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Physicians have been the traditional target of malpractice litigation in Canada. Recently there appears to be a trend to more intense targeting of hospitals and their employees during litigation aimed at achieving a monetary settlement for poor medical or surgical outcomes. This increases the likelihood of involvement by respiratory therapists (RTs) as expert and defendant witnesses in medicolegal action. This presentation focuses on what, for most allied health professionals, is hostile territory. Through understanding of the malpractice litigation process, case studies, common sense, humility, and humour, RTs can learn to survive, and perhaps even enjoy, their dalliances with the law.

05 THE RESPIRATORY THERAPIST: TALES OF EVERYDAY HEROISM

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This lecture reviews eight circumstances in which confident, learned, and courageous respiratory therapists (RTs) responded to a crisis, thought and acted outside the box, or challenged unproductive resistance to save the lives of patients. Actual patient applications include evidence-based support for the RT’s actions. Also reviewed are the strengths and weaknesses of both randomized controlled trials (RCTs) and meta-analyses and how RCTs and the meta-analysis affect patient care. This review is followed by a discussion of how the science of medicine versus the practice of medicine play equal roles in patient care. The primary goal of the talk is to inspire RTs to be proud of what they do, to realize their potential, and to recognize their often lifesaving contributions to the care of patients.

06 COPD AND AAA: ENDOVASCULAR VERSUS OPEN SURGICAL REPAIR

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Compromised lung function is one of the main patient-related risk factors for postoperative respiratory complications. Patients with severe chronic obstructive pulmonary disease (COPD) are up to six times more likely to have postoperative complications than those without COPD. COPD, specifically chronic lower respiratory disease, was the third leading cause of death in the United States in 2014 according to the Centers for Disease Prevention and Control (CDC). Furthermore, the CDC reports 9,863 deaths in the United States in 2014 were directly due to aortic aneurysms, with another 1,500 deaths resulting from surgical repair procedures—making abdominal aortic aneurysms (AAA) the 14th leading cause of death in the United States. Screening programs of the general population report a 7%–10% prevalence of abdominal aortic aneurysms in people with chronic obstructive pulmonary disease. Considering the global burden these diseases impart independently, the relatively large co-morbidity of the two together and the risk for surgery, it only makes sense to explore the optimal management of AAs when pulmonary function is compromised. The aim of this presentation is to investigate the relationship between COPD and abdominal aortic aneurysms, more specifically the effect this reduced pulmonary function has on the decision and management of traditional versus modern AAA surgical repair. The comparative analyses are fairly limited; however, a review of the literature supports a slightly more favourable outcome using the more modern approach of endovascular repair. Mortality does not seem to differ significantly between the two, whereas in-hospital complications and death occurred in nearly double the cases after open surgical repair compared with endovascular repair (EVAR). Additionally, the need for extended ICU stay and ventilation days was less in the EVAR cases.

07 EXPANDING THE RT ROLE IN PEDIATRIC TRANSPORT

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BACKGROUND: A Saskatoon pediatric transport team (PTT) was initiated in September of 1998. The team consists of a Registered Respiratory Therapist (RRT), Registered Nurse (RN), and a Pediatric Intensivist.
Currently, RRTs and RNs were on call for the Saskatoon PTT. The on-call team ran for 12 years until 2010, when RNs were granted supernumerary positions. The supernumerary position allowed the nurses to be based out of Saskatchewan’s trauma hospital, help with patient workload in the pediatric intensive care unit (PICU), and reduce time to patient statistics. The nurse did not carry a patient workload independently; therefore, no report was needed, nor was there a delay in time waiting for relief staff to arrive prior to transport departure. In 2014, the only other unit in Saskatchewan that was functioning as a PICU ended its services. Saskatoon was left as the only operating PICU and PTT. Saskatchewan’s PTT then became Saskatchewan’s PTT. The expansion to a provincial PTT now meant that one team was to service 855 km to the farthest northern nursing station in Saskatchewan and 405 km to the farthest southern hospital. Additionally, a lack of specialized services required frequent transport of pediatric patients out of province. It was not until 2014 that the RRT for the PTT became supernumerary staff. The role and patient care have both since rapidly improved for the PTT as team members became more specialized. Scope of practice of the RRT has evolved to include life-saving procedures such as cricothyrotomy, chest tube insertion, pediatric arterial line insertion, and intravenous/intravenous line insertion. Team members have improved the autonomy with which they are now able to practice. More consistent use of non-invasive and invasive respiratory therapies has led to faster results and improved patient safety and outcomes.

OBJECTIVES: To explain the role of a RT during pediatric transports in Saskatchewan. To understand how this role has expanded in recent years, and how the scope of practice for respiratory therapy has evolved.

METHODS: We will examine current and previous practices of the Saskatchewan PTT, along with collected data for trip volume, patient disposition, and treatments required for the patients who are transported by the team. A recent study outlining pediatric transport within Canada will be examined. Modalities of respiratory support utilized by the team and the equipment the team uses will be examined. Specific case studies will be presented from our personal experiences to show where the RT role improved patient outcomes.

CONCLUSIONS: The pediatric transport role is a fast paced, quickly evolving role for the respiratory therapy profession. Our unique knowledge of respiratory treatments, troubleshooting, and equipment make the RT a key part to the continued success of the specialized transport teams in Canada.

08 ADJUSTING FROM LAB SIMULATION DEBRIEFING TO CLINICAL DEBRIEFING
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INTRODUCTION: High-fidelity simulation has a great benefit on learning, especially within the field of respiratory therapy. Course material can be applied with hands-on learning during simulation scenarios. Debriefing on these scenarios is essential for learning and building upon knowledge. Adjusting to the clinical atmosphere is challenging for most students. Within the clinical environment, debriefing is structured differently and occurs less often. Debriefing is a valuable tool and there is an opportunity for it to be utilized more effectively and at a higher frequency in the clinical setting.

BACKGROUND: Recent experience of high-fidelity simulation involving large amounts of debriefing is compared to personal experiences of debriefing during clinical placement. What more can be done in the clinical environment to implement more, and effective, debriefing?

OBJECTIVES: This session partially explains Conestoga College’s high-fidelity simulation program and how this prepares students for their clinical placement. It discusses the importance of debriefing in a simulation environment and clinical environment, and it explores different styles of debriefing.

CONCLUSION: The effectiveness of debriefing is explained from a student standpoint, and it results in an ability to use a foundation of knowledge during simulation and to improve upon skills during simulation scenarios and afterwards during a debriefing session.
METHODS: The EBSCOHOST database was accessed through Thompson Rivers University using the following key terms: neurologic*, hypox*, sleep, apnea, ischem*, (not) ischem*, cardi* and cognit*. Initially, eight articles were reviewed to determine which cognitive capacities would be further researched. This literature review will look at linking evidence that suggests neurologic complications such as stroke, cognitive dysfunction, Alzheimer’s, and depression can all result from cardiac complications due to hypoxemia during OSA. This review will also define terms such as hypoxia, hypoxemia, and intermittent hypoxia. By definition they are all different; however, many authors seem to use two or more of them interchangeably or use one when according to the definition, and they may mean to use another.

RESULTS: A quick search of the EBSCOHOST database suggests that no reviews have looked at the effects of hypoxemia on these cognitive abilities. The only similar recent review, “Oxidative Stress in Obstructive Sleep Apnea and Intermittent Hypoxia – Revisited – The Bad Ugly and Good: Implications to the Heart and Brain” (Lavie, 2015) looked at the potential protective and or damaging effects of oxidative stress on the cardiovascular and cerebrovascular systems.

12 STUDENT PERSPECTIVES ON THE PERCEPTIONS OF RESPIRATORY THERAPY

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Respiratory therapy is a career that takes us from the beginning of patient life to the end. But do members of the general public, or even other interhospital professionals, really know what the day of a respiratory therapist entails? As a student in the classroom setting, we can only gather so much from our research, job shadows, conversations, and simulations. It is when we are truly immersed into the clinical year that we get to experience the ins and outs of this very rewarding and challenging career. We would like to present a student respiratory therapist’s outlook on how others perceive our profession and how we perceive it ourselves.

We will use our experiences as successful clinical students to guide the next generation of student respiratory therapists and to promote and allow others to get to know this exciting career. We will discuss with students the typical workload during clinical year, survival tips, and how to build portfolios. We will touch on the importance of interprofessional care in everyday practice as well why it’s important for clinical competen-
cy attainment. We will discuss the role of respiratory therapists as we experienced firsthand at our clinical sites. Further, we will discuss topics that we think are critical to developing a good understanding of expectations of respiratory therapists in clinical practice. Finally, we will talk about the great things respiratory therapists do and why we are honoured to be a part of this community of intelligent and compassionate individuals.

13 MANAGING ACUTE SEVERE ASTHMA IN VENTILATED PATIENTS

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Asthma is a common chronic disorder of all age groups, predominantly affecting pediatric populations. The current worldwide prevalence of asthma is around 300 million, which may be increased to 400 million by 2025. In Canada, approximately two out of three asthma patients who are treated in general practice suffer from uncontrolled asthma. Amongst the chronic diseases, asthma poses the biggest economic burden on the health care system. Asthma patients consume the highest health care resources by spending more days in hospital and have increased morbidity and mortality. The economic burden of asthma includes both direct and indirect costs. Acute severe asthma accounts for only 5% of the total asthma population, but the costs associated with it is 50% of the total asthma cost. After physicians, the first line of health care provid-
ers who are directly involved in the management of asthma are respirato-
ry therapists. This review will discuss management of mechanically ventilated acute severe asthma to determine the best practices in strategies of their care, focusing on both ventilator and non-ventilator management strategies. This presentation will include intubated and mechanically ventilated acute severe asthma patient populations of all age groups, covering peer-reviewed research and review articles published in the last 13 years.

14 THE STUDENT EXPERIENCE OF ASSESSMENT IN SIMULATION

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There exists an identified knowledge gap with respect to the impact of assessment on the social aspects of the clinical simulation learning environment in health professions education. This session presents the recent findings of an original research study aimed at understanding how approaches to assessment influence student learning experiences during clinical simulation. The primary objective of this study was to understand how different approaches to assessment—such as whether or not the simulations are graded or marked to measure achievement—influence social aspects of the learning environment in clinical simulation-based respiratory education. Those factors that might affect learners’ emotional or psychological status or that may impact their sense of safety and trust in the learning environment were examined from a variety of perspectives by exploring the experiences of a sample of respiratory therapy students and their instructor at a Canadian entry-to-practice respiratory therapy program. A qualitative case study design was adopted to achieve a deep understanding and description of the social aspects of learning in this unique and nuanced learning environment. The understandings derived from this research can be used to support the design of enhanced clinical simulation learning environments for learners in respiratory therapy education.

15 DO E-LEARNING MODULES REALLY WORK?

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The development of psychomotor skills and the confidence associated with performing professional tasks are key milestones for health sciences students. Traditionally, these students are provided with lectures, readings, and limited simulated lab time in the didactic component of their education. Due to heavy course loads it is difficult to provide one-on-one training for all students and to ensure that this training translates into strong professional competence. We have therefore created an e-learning module to be used in conjunction with traditional didactic education for a common healthcare skill: venipuncture. There is limited research on the effectiveness of e-learning modules in developing psychomotor skills for health sciences students and practitioners. Our goal is to evaluate the effectiveness of our supplementary module in traditional didactic programs. Students from these programs at Fanshawe College will be recruited and randomly assigned to a control or a study group. Students will be scored based on three main components: 1) psychomotor skills, 2) level of confidence, and 3) academic competence. We hypothesize that the study group will outperform the control group in all three areas of evaluation. Overall, this work will provide insights...
into the utility of e-learning in helping students achieve key competencies required in their future professions.

16 COMPARISON OF SRT PEDIATRIC EDUCATION: STUDY DESIGN
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BACKGROUND: Student respiratory therapists (SRTs) are required to complete pediatric training as a part of their clinical internship. There are existing challenges in accommodating all students at pediatric institutions; therefore, simulation becomes an enticing method to train SRTs in pediatric care. Currently simulation is being used to supplement pediatric training for students. However, different schools have a different blended model of percentage time spent in clinical-based training versus simulation-based training during their rotation, and formal evaluation of each educational model has not been done to date.

OBJECTIVE: Our goal was to design a study to determine whether student respiratory therapists who complete predominantly simulation-based pediatric rotations demonstrate comparable performance with respect to pediatric airway management when compared to students who completed a clinical-based rotation. This presentation is to discuss our study design and our experiences with this research project to date at the Hospital for Sick Children.

STUDY DESIGN: Students are scheduled for a specific model of education (either 2.5 weeks of clinical placement or 2 weeks of approximately 50% simulation and 50% clinical placement). Our study design involves evaluation at three points: 1) baseline testing: knowledge questionnaire, reported levels of self-efficacy, and demographics; 2) post-rotation testing: knowledge questionnaire, performance in a simulation scenario (using a standardized scoring tool), reported levels of self-efficacy and cognitive load, and self-appraisal in simulation; and 3) retention testing (3 months): knowledge questionnaire, performance in a simulation scenario (using a standardized scoring tool), reported levels of self-efficacy, and cognitive load and self-appraisal in simulation.

IMPACT: It is hoped that the results of this research will provide educators with evidence to optimize simulation-based rotations for SRTs, potentially leading to improved provision and efficiency of education and subsequent patient care.

17 TOOLS FOR THE EVALUATION OF ATTITUDES IN RESPIRATORY THERAPY EDUCATION PROGRAMS—A WORKSHOP
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Training programs offer courses and internships that enable validation of students’ learning compared to development of their skills. Assessment of knowledge and know-how plays a major role in the way students provide care and can be used to establish their level of skill. But what about assessment of their soft skills? Soft skills are an essential component of complete skills development. Students show their soft skills in both the classroom and clinical settings. They do not realize that their behaviours influence their delivery of care in context as well as their future job prospects, since employers observe them during their internships. Their soft skills represent added value that makes a difference. Instructors often encounter challenges when coaching students on full development of their soft skills. A lack of tools has made soft skills assessment difficult, leading to reflection that has prompted questions about the essential characteristics of assessment tools instructors can use to objectively judge RT students’ soft skills. Following a review of literature covering three concepts—soft skills, assessment, and assessment tools—five specific objectives were retained for use in addressing the challenges presented by soft skills assessments: 1) establish a soft skills nomenclature for the respiratory therapy program; 2) describe soft skills as observable, demonstrable assets; 3) design a self-assessment tool for soft skills development, to be used by students in the RT program; 4) design a checklist of observable behaviours, to be used in assessing RT students’ soft skills; and 5) design a descriptive grid for assessing RT students’ soft skills.

This presentation summarizes a research and development-type test intended for the design of three soft skills assessment tools: 1) a self-assessment tool, 2) a checklist of observable behaviours, and 3) a descriptive self-assessment grid. Upon achieving the first two specific objectives, the author asked instructors in the respiratory therapy techniques department at two institutions—College de Rosemont and College de Valleyfield—to perform a validation of the soft skills assessment tools. Analysis and interpretation led to attainment of the specific objectives set. The data gathered were used to establish the nomenclature for professional soft skills and to take a critical look at the design of soft skills assessment tools intended for students in the respiratory therapy program. The tools were improved, i.e., made more effective, based on the feedback and suggestions received. This test identifies eight soft skills that students in the RT program should show they possess. These soft skills are demonstrated through 42 observable behaviours. Designing the assessment tools enables an objective look at the development of students’ soft skills. A single task remains: to check the transferability of results between programs to coach other instructors who are having difficulty with soft skills assessment. The presentation is followed by a hands-on workshop in which the terms described can be put into practice and the transferability and applicability of the results observed.

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LEADERS’ FORUM

18 HOW CAN RESPIRATORY THERAPISTS SOLVE ALARM FATIGUE?
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Alarms are particularly numerous in intensive care units and can cause alarm fatigue, which results in delayed recognition and responses to critical alarms. Delays can result in patient harm, increased lengths of stay, and death. Alarm hazards related to cardiac monitors contributed to patient safety incidents in the adult intensive care unit at the Credit Valley Hospital site of Trillium Health Partners. These incidents were the impetus for a respiratory therapist led quality improvement project. Using improvement science methodologies and quality improvement tools, Plan-Do-Study-Act cycles were applied to test and implement change ideas. An interprofessional team, which included a frontline respiratory therapist champion, developed and tested ideas for improvement. The resulting quality improvement intervention consisted of daily electrode changes, assessment of alarm parameters, arterial line stabilizing devices, and adjustment of alarm default settings. The results of this intervention were a 13% decrease in the number of alarms, improved staff satisfaction regarding noise levels and perceptions of alarm fatigue, and elimination of alarm-related patient safety incidents. Respiratory therapists were a key component to success and can act as both leaders and essential team members when embarking on projects to improve quality and patient safety.

19 WORKING WITH MULTI-GENERATIONS IN HEALTH CARE
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Maintaining cohesion and understanding among a multigenerational workforce in respiratory therapy remains highly relevant for its operation-al fluency and efficiency for the specialized medical profession, as it does
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for the general health care sector at large. It is therefore important to examine this demographic dimension in the Canadian health care context, both through its analysis of its most recent indicator changes along with the newly emerging practical and theoretical approaches, to bring both the problems and solutions of this topic to the forefront. This presentation begins with an overview of all major variables that influence cohesiveness, or lack of thereof, among the health care workforce, before emphasizing the focus on the age-group demographic dimension of the Canadian health care sector. This will be then followed by analyzing the pinnacle age demographic changes experienced for the sector. The main characteristics of each generational group, including their real and perceived strengths and weaknesses among their peers, will be identified to then discuss how multigenerational misunderstanding arises. Recommendations will follow, as cited in notable qualitative and quantitative research studies, the speaker’s own small survey findings, as well the personal suggestions obtained from the speaker’s own field RT training and professional work experiences in the RT field. Lastly, the presentation will address existing research gaps and where further research seems most essential.

20 IMPLEMENTATION OF STANDARDIZED TOOL FOR CHARGE RT HANDOVER
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There is a growing body of evidence that shows the majority of adverse events in hospitals are due to gaps in communication and handover failures. Improving handover and, therefore, communication is a means to improve patient care and safety. Literature shows that the use of standardized handover processes improves communication and reduces errors. The Critical Care Unit (CCU) at the Hospital For Sick Children has experienced a steady increase in patient census and overall acuity, and there is increased awareness throughout the hospital about the culture of patient safety. As such, the Charge RT role has now become increasingly complex, necessitating careful balancing of patient care and safety with staffing and equipment resources and increased fiscal and administrative responsibilities. After conducting a needs assessment and focus group, the Charge RT group was able to develop a standardized handover tool aimed at improving communication between Charge RTs at shift change. Standardized handover tools for patient-to-patient handoffs are currently in use throughout the CCU; however, there is currently no handover tool developed for Charge-to-Charge handover. When developing this pilot handover tool, the Charge RT group used some discussion points that came out of the needs assessment and focus group, and also took into consideration larger organizational markers of patient safety as described. This was done in an effort to develop a shared mental model amongst the Charge RT group and between the Charge RT group and the hospital. The aim of using a standardized Charge-to-Charge handover is to improve communication and patient safety in the CCU at Sick Kids, decrease individual variability when giving handover, and improve overall staff satisfaction in the handover process.

21 ADOPTING POSITIVE LIFESTYLE HABITS TO PREVENT PROFESSIONAL BURNOUT
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Many health care professionals are faced with fast-paced, high-stress, and high-pressure situations, shift after shift. Over the years this stress, shift work, lack of sleep, poor nutrition, and decreased physical activity levels lead to increased sick time, development of chronic disease and, ultimately, burn out from their career. This presentation will discuss the physical and emotional implications of shift work, working in high-pressure environments with time constraints, and dealing with death and dying. Discussion will revolve around health care workers becoming proactive rather than reactive when it comes to their own personal health and well-being. This will be achieved by exploring the categories of physical activity, healthy sleep habits, and nutrition. The goal of this presentation is to empower health care professionals to adopt a healthy lifestyle that will not only prevent chronic disease and career burn out, but will increase quality of life.

22 REDEFINING COMPETENCIES IN RESPIRATORY THERAPY
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Competence is a commonly and widely used term in health care. Competencies are developed to guide safe clinical practice and to provide a standard against which clinicians are evaluated. When one thinks of the traditional use of the term “competence,” it is often a measure of: a) clinical hands-on skill, b) critical thinking, and c) decision-making ability. Following the American-based report “To Err is Human” in 2000, patient safety advocates around the world initiated discussions on the scope of “teamwork.” As a result, competency evaluations based on interprofessional teamwork and team environments began to emerge. The World Health Organization (WHO) indicates “Effective teamwork in health-care delivery can have an immediate and positive impact on patient safety. The importance of effective teams is increasing due to factors such as: a) the increased incidence of complexity and specialization of care, b) increasing co-morbidities, c) the increasing incidence of chronic disease, d) global workforce shortages, and e) initiatives for safe working hours” (World Health Organization, 2012). Even so, competency evaluations that measure clinical skill, critical thinking, and decision-making ability from the perspective of the individual, without full consideration of the individual’s competence as a member of a team, still dominate. Despite significant development in the last decade, there remains an opportunity to expand the definition of competence to reflect the broadened scope of health professionals within an interprofessional team-based model of care. In 2014, Michael Garron Hospital (MGH), a large community hospital in Toronto, embarked on a competency framework redesign for all allied health professionals to more effectively reflect the best practices and standards of interprofessional practice. The redesign included respiratory therapists (RTs), and focused the competency assessment not only on respiratory-specific skills and critical thinking, but also on patient safety, service excellence, excellence in team function, and patient-centred care. Adapted from the Canadian Interprofessional Health Collaborative National Competency Framework, the MGH competency framework is the driving force behind both the standard of practice expectations for all RTs as well as the annual performance review for clinicians. This presentation will provide participants with both the theoretical and practical components of the development of a competency-based framework for RTs that focuses on clinical skill as well as performance as a member of an interdisciplinary patient-centred care team. The presenter will review supporting evidence for a broadened definition of “competence” and present the process, outcomes, and lessons learned in building a competency framework that can be applied to a variety of settings.

23 CREATING A DISASTER PLAN FOR RT DEPARTMENTS
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As the number and scale of disasters are increasing worldwide—due in part to increased rates of urbanization, deforestation, environmental degradation, and to intensifying climate variables—it is essential for hospitals to plan and prepare for disasters. Hospitals play a vital role in disaster planning and response. Thus, a comprehensive disaster planning approach is required. This presentation will examine the existing literature on disaster planning for health care facilities, with a focus on the role of respiratory therapists (RTs) in disaster planning. The presentation will include an overview of the current legislative and policy landscape, as well as the role of the Canadian Association of Respiratory Therapists (CARTh) in disaster planning. The presentation will also include a case study of a local hospital’s disaster planning process, with a focus on the role of RTs in planning and response. The presentation will conclude with recommendations for the development of a comprehensive disaster planning approach for RTs in health care facilities.
response but they are also vulnerable to the negative impacts of disasters. While every hospital should have a disaster plan, they are often out of date and incomplete. Hospital disaster plans may not include respiratory therapists (RT) or they include RTs in roles for which they are not trained in. Respiratory therapy departments are unique since they are often decentralized, with one department covering an entire hospital or group of hospitals. Respiratory therapy departments should have a robust disaster plan to aid RTs during a disaster. The presentation will examine how to create an all-hazards disaster plan based on the key concepts of anticipation, monitoring, response, and learning.

ANTICIPATION: What do you anticipate will occur during a disaster? How can you anticipate, plan and prepare for a disaster?

MONITORING: What are our current responsibilities as a respiratory therapy department? What is the pre-existing disaster plan? Where would the hospital’s emergency operating centre be located? What is the hospital’s incident command system? What are our departmental responsibilities during a disaster? For example, if medical gases are no longer working, is the RT department in charge of providing tanks of medical gas to the entire hospital? What are the medical gas, loss of power/back-up power, mass casualty, etc. plans? What are our RT department responsibilities in those plans? How long is the battery life of our ventilators, BIPAPs and other equipment?

RESPONSE: How would you know what a department would you respond to a disaster? What would you do if you had to evacuate? Lost medical gas? Lost power?

Learning: Going forward what can your department do to prepare? What have you learnt from previous experiences with disasters or crisis situations? What worked and did not work? Is there a need for practice and training?

The presentation will also go over the creation of action cards, and a quick-grab-n-go RT response handout. There are examples from a disaster plan created for a major hospital in Vancouver.

24 TAKING CARE OF OUR COMMUNICATION!

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Counselling, documentation, journals, websites... sources of health information are certainly numerous, but are they understood by our patients? Unfortunately, according to recent studies in health literacy, the answer is no. In truth, national surveys indicate that 60% of adults and 88% of seniors are not health literate. These results suggest that many of our patients have difficulty in obtaining, processing, and understanding the health information needed to make informed health decisions such as choosing a healthy lifestyle or taking medication properly. In addition to defining health literacy and the impact of limited literacy skills on the health of the individual, the presentation will portray the situation to defining health literacy and the impact of limited literacy skills on the health of the individual, the presentation will portray the situation.
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support them. Don’t settle for average. Start on the high purpose of making respiratory therapists the example of employee engagement in your organization.

CRITICAL CARE

27 WITHDRAWAL OF LIFE-SUSTAINING CARE POST-TRAUMATIC BRAIN INJURIES
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Respiratory therapists play an integral role in caring for patients who have suffered a traumatic brain injury (TBI), as well as extubating patients once the decision to withdraw life support has been made. It has been found that there is significant variation across Canada in terms of how long physicians wait to recommend withdrawal of care after a patient has suffered a severe TBI (Turgeon, 2011). Some centers wait less than 3 days, while others wait much longer with the hope that decreased swelling over time will deliver a more positive prognosis (Turgeon, 2011). The decision to recommend withdrawal of life support is a complicated one and needs to take several things into account (Creutzfeldt, 2015). This includes as accurate a prognosis as possible, the patient’s wishes, and the alternate decision-maker’s wishes (Cook, 2003). What factors influence a physician’s recommendation to withdraw care? Health care professionals must work with the patient and (or) the alternate decision-maker(s) to come to a mutually agreeable decision, but what obstacles make this difficult? This presentation will look at different approaches to withdrawal of care currently used across Canada; current practices for determining an accurate prognosis; and coming to a mutual decision with the patient, alternate decision-maker, and health care team.

28 YOU, ME, AND THEM: MAKING ECMO INTERPROFESSIONAL
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Providing ECMO support (ECMO) can be a complicated process for experienced providers, let alone new learners. Our challenge was to find a way to provide a standardized curriculum and education to an interprofessional group with a wide variety of training. We capitalized on the experience and expertise of a number of various professions to evaluate, revamp, and deliver an interprofessional curriculum to our learners. From the outset, we identified the gaps within the old model of education and care delivery. Our goal was to increase consistency of care and standardize the education to our team. The process involved having all curriculum developed by content experts, then peer reviewed by the interprofessional team. It was then beta tested, evaluated, adjusted, and beta tested again. This continues to be an iterative process, following a basic process improvement paradigm (Plan, Do, Study, Act). Our curriculum development process has been a model for improvement for other practice variances; in other words, we have used this model to standardize and improve practice in other areas.

29 CARDIAC ARREST MANAGEMENT POST-CARDIAC SURGERY
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Approximately 1,300 patients undergo cardiac surgery at the Foothills CVICU annually; of those, 0.7%–2.9% will experience a postoperative cardiac arrest. In Canada, it is common practice to follow the American Heart Association (AHA) recommendations when it comes to basic life support (BLS) and advanced cardiac life support (ACLS). In Europe, they follow guidelines that are provided by the European Resuscitation Council (ERC). Identifying that post-op cardiothoracic patients are a special population requiring special management means that management of cardiac arrest needs to be catered to them. AHA does not provide clear recommendations for resuscitation of postoperative cardiothoracic patients. The use of ERC guidelines, which provides important evidence-based deviations from ACLS, may bring better assistance for CPR in these patients while reducing mortality. Here we will review key differences and supporting evidence between ACLS and ERC guidelines that are specific to resuscitation after cardiac surgery. Key areas of debate are a) swiftly identifying and eliminating reversible causes of arrest, b) defibrillation or pacing should occur before external cardiac compressions, c) cautious use of epinephrine to prevent potential rebound hypertension, and d) decision for retematomy should be made within 5 minutes to promote optimal cerebral perfusion with internal massage. The ERC offers a more specific and appropriate management of cardiac surgical arrests and should be adopted as the standard in Canada. For the first time, FMC CVICU will be implementing these key modifications to ACLS in hopes of achieving higher survival rates. Follow how they created new algorithms, trained their staff, and exercised new simulations scenarios and simulation mannequins, which will help shape their practice for years to come.

30 I COLLABORATE, THEREFORE I AM—AN RT!
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Collaborative health teams, person-centred care, and collaborative practice are the direction health care is moving. Health care delivery is less and less about individual health professionals making their contributions in a silo. We are seeing the transformation of health care, and health education correspondingly, and a culture shift toward greater interprofessional collaborative care. RTs are very well placed to be leaders in collaborative practice. This presentation will focus on the role of RTs on the interprofessional team in the ICU and the potential to make a positive impact on patient outcomes with improved collaboration.

31 PREVENTING VENTILATOR-ASSOCIATED PNEUMONIA: WHERE IS THE BENEFIT?
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The prevention of ventilator-associated pneumonia (VAP) has been a serious focus in Canada. In 2012, the Centers for Disease Prevention and Control changed to ventilator-associated event surveillance due to the multiple issues with VAP surveillance and reporting. Recent research has demonstrated that VAP preventative measures proven to reduce VAP have not resulted in a reduction in ICU or hospital length of stay. The cost versus benefit of some VAP bundle strategies is no longer evident. This presentation will discuss these issues, the supportive evidence, and provide a recommendation for future quality initiatives.

NEONATAL AND PEDIATRIC

32 BETTER TOGETHER: THE POWER OR PATIENT AND PARENT PARTNERSHIPS
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Can J Respir Ther Vol 53 No 2 Spring 2017
Patient- and family-centered care places emphasis on mutually beneficial partnerships between patients, families, and health care professionals. Working in partnership with patients and parents and allowing them to participate in the decision-making process reduces uncertainty and fear, which are predominant factors in distress. This results in an increase in quality and safety, as well as increased satisfaction for both the family and health care team.

33
50 YEARS OF NEONATAL CARE: ARE WE LEARNING FROM OUR MISTAKES?
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Neonatal medicine has changed a great deal over the past 50 years, and Dr. Don Reid has been a part of this. From London to Regina, Newfoundland, and Halifax, he has witnessed incredible changes in neonatal care—and the incredible role that RTs have had in these changes. Through 50 years of entertaining stories of evidence-based practice, successes, and failures, Don reviews the role that RTs have had in changing the face of neonatal care and will inspire attendees to continue to expand and grow that role within neonatal and all healthcare.

34
NEO/PEDS CRITICAL CARE IN THE AIR
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Have you ever thought about putting the knowledge and skills you have learned in the intensive care unit to the test at 20,000 feet as a member of an air medical transport team? Do you have the courage it takes, knowing that the difference between a good outcome and a bad outcome for your patient depends on your ability to diagnose what is wrong? Do you have the confidence needed to draw upon your past critical care experience and knowledge and combine it with the technical capability to do what is needed in a challenging and ever-changing environment? Have you ever wondered what it is like to be a member of an air medical transport crew? This presentation, from members of the CAMTS accredited Nova Scotia EHS LifeFlight team, will give you a view of what it takes to be part of the air medical crew, in case study format, by two members of the neonatal-pediatric team. We are a full-time, dedicated RRT/RN team that uses rotor wing, fixed wing, and ground transport vehicles to service all of the Maritime provinces. We work with an advanced scope of practice and provide critical care, including ECMO, on transport. You will come away inspired by the courage, stamina, and expertise of these critical care colleagues who put themselves to the test every time they take off.

35
AUTONOMY IN TEAMWORK: WHY IT MATTERS
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Interprofessional teams have been shown to improve patient care and outcomes, but rarely exist in true form in the clinical world. The interprofessional team in the NICU at Sunnybrook HSC has evolved over decades and aspires to a trans-professional goal. Respiratory outcomes from this unit are extremely good and largely attributed to the fact that respiratory therapists essentially control ventilator management of patients independently. While hard evidence is lacking in this area, it is hoped that the link between outcomes and the interprofessional model of care can be demonstrated, and how the extensive use of non-invasive modes of ventilation may help others improve respiratory outcomes. The latest and historical outcomes as reported to the Vermont Oxford NICU collaborative are presented for reference and give a frame of reference.

36
CREATING A REGIONALIZED LUNG HEALTH PROGRAM
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In 2005, the Champlain Lung Health Network was created to bring lung health champions (patients, primary, tertiary, home care, etc.) together to improve lung health services in the Champlain Local Health Integration Network (LHIN). This patient-driven network created “The Breathing Easier Guide”, an in-depth inventory of services produced to 1) educate residents about their lung disease, 2) empower patients to seek out lung health services that they require, 3) decrease health care utilization through self-management, and 4) improve quality of life. Today, this network has grown to 36 representatives that meet quarterly, follows an annual workplan, and works together to improve access to the much-needed lung health services in the region. Much of the success of the network is due to LHIN support and the relationships that have been built between tertiary and primary care institutions. These relationships allow for candid discussions between health care providers which result in 1) an improved transition from hospital to home, 2) an increased awareness of all lung health services across the region, and 3) a common goal for funding requests to decrease duplication of services. This presentation will focus on the Lung Health Networks initiatives and successes to date. Delegates will have an understanding of partnership building (through networks) and engaging stakeholders as a way to increase resources with today’s limited health care funding.

37
RESPIRATORY CARE IN NEUROMUSCULAR DISEASE
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Muscular Dystrophy (MD) Canada and The Hospital for Sick Children (SickKids) are partnering to create a presentation that will highlight the leadership role of respiratory therapists in the management of neuromuscular disease (NMD). Neuromuscular disease is characterized by progressive muscular impairment that leads to a loss of ambulation, swallowing difficulties, and respiratory failure. Thus, education about NMD management remains a priority to assist patients to stay healthy at home and in the community, while preventing hospital admissions. It is necessary that respiratory therapists and caregivers are active in knowledge acquisition around new technology and therapies as they care for these patients. In this presentation, various therapies will be examined, with focus given to pulmonary clearance, maintaining good respiratory health, and challenges and best practices around ventilatory support through case studies. Seamless transition from hospital to home care is an identified area for improvement. This applies to both adult and pediatric care. It is primarily due to lack of understanding of pulmonary clearance therapies and the shift to managing more patients via noninvasive ventilation. We would like this platform also to advocate for the increased need for respiratory therapy support in the community and to facilitate a knowledge-to-action plan for achieving this. Individuals with NMD are surviving well into adulthood. We would like highlight SickKids’ transition partnership with WestPark Rehabilitation hospital. We will also provide feedback from our adult clinicians as they care for these patients on the receiving end. This part of the discussion will highlight quality improvement work that has been done looking at patient...
and caregiver experiences after transition to adult care and the challenges patients have faced. It is important to listen to these inspirational patients and learn about their disease. In doing so, overcoming challenges and barriers to respiratory management is better understood. Patients and their caregivers are also then empowered to eventually choose treatments most suited to their lifestyle. It is key to mention here the importance of the patient having a treatment plan well in advance of any progression of disease or acute illness. Included in this plan should be goals of care documentation and expectation setting for adherence to therapy to achieve optimal day-to-day and long-term functioning. We also would like to highlight work that is currently being done in respiratory management of NMD. RRTs are increasingly partnering with inter-professional colleagues, community providers, and patient organizations such as MD Canada to provide support, education, and research to this ongoing area of respiratory health. Good respiratory care of patients with NMD is resulting in prolonged survival and improved quality of life. These achievements have been made possible by advocacy from patients themselves, caregivers, and patient organizations such as MD Canada, but also from the field of respiratory therapy and the advances RRTs have made in respiratory rehabilitation to improve everyday life for patients and their families.

38 SHISHA25: SHISHA TOBACCO USE IN NEWCOMERS TO CANADA
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This presentation will describe main definitions and challenges encountered by newcomers in Canada and a brief view on the current Canadian response to the Syrian crisis. Shisha has an exotic-flavored aroma, which is made up of different mixes such as molasses, honey, and dried fruit with tobacco leaf. Other names are used to define it such as hookah, narghile, waterpipe, and hubbly-bubbly. It is a custom in the Middle East to smoke shisha, but it’s also popular in the younger generation in the developed countries. It’s an emergent concern because it is associated with health risk factors such as respiratory and cardiac diseases, cancer, and adverse effects during pregnancy. The behavioral endorsement is prevalent because of its social, pleasant, and relaxing connotations. Loopholes exist in the regulation of shisha, resulting in it being smoked indoors in cafes, lounges, and bars. In 2015, an Ontario study assessed the quality of air in both indoor and outdoor shisha cafes. The study demonstrated Indoor Air Quality Index (AQI) of PM2.5 of 1419 µg/m3 in shisha cafes. Recognizing that an advisory to avoid all physical activities outdoors would be warranted if the air quality has a PM2.5 of 500 µg/m3 the AQI in shisha cafes should be of concern. Moreover, the public misconception on the myth of shishas’ safety and harmlessness leads to its overuse. This presentation will also present the findings of a systematic review on shisha use that is currently being conducted. These findings will be interpreted relative to the need for cultural competence amongst RTs when assessing for tobacco/shisha use. A video will be shown to illustrate the smoking session if needed, and discussion will highlight the need for response by Canadian Respiratory Therapists. RTs can be part of initiatives aimed at addressing the effects of smoking shisha.

39 OBTAINING QUALITY DIAGNOSTICS FROM A MULTICULTURAL POPULATION
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BACKGROUND: The 2011 National Household Survey provided a very multicultural and multilingual image of Canada. The survey results showed 1 in 5 people in Canada were foreign born, with over 200 different languages identified as “mother tongue”. With the diversity of the Canadian population, respiratory therapists require a unique understanding of culture and communication to obtain diagnostically appropriate and reliable testing. What respiratory education fails to teach is the importance of understanding cultural and effective communication, which is arguably a “prerequisite to safe healthcare” (Schyve, 2007).

DISCUSSION: Based on experience and research in culture and communication, this presentation will examine the role culture plays in obtaining quality respiratory testing. Examination of cultural barriers within the most represented population groups in Canadian society will provide therapists with an understanding of how beliefs and customs affect diagnostic testing. Cultural topics to be discussed include attitudes towards suffering, etiology of disease, distrust or misunderstanding of Western medicine, and lack of cultural understanding from healthcare providers. Furthermore, the presenter will examine barriers of both nonverbal and verbal communication. Nonverbal communication barriers in conjunction with cultural understanding can lead to many issues while performing diagnostic testing. Barriers such as eye contact, voice, and body position will be reviewed and insight will be provided for improved cultural understanding. Verbal communication cues such as double negative questions, questioning techniques that possess two embedded questions, and Canadian cultural nuances will provide the foundation of possible barriers to effective diagnostic testing. While examples will mainly focus on pulmonary diagnostics, the presenter will provide extrapolated examples to other areas of the respiratory therapist’s role.

CONCLUSION: The presenting clinician will create awareness on how Canada’s multicultural makeup affects the respiratory therapist’s clinical practice. The conclusion of this presentation will provide participants with concrete communication strategies and tools to ensure accurate diagnostic results, while maintaining cultural sensitivity.

40 ASTHMA CARE APPS IN THE PATIENT’S POCKET
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BACKGROUND: The Public Health Agency of Canada (PHAC) reports that 2/3 of Canadians diagnosed with asthma do not have adequate control over their symptoms, which could compromise their daily activities and reduce their quality of life. Available therapies to control asthma require continuous motivation and positive reinforcement to ensure patient compliance. Currently, there are many accessible apps that are available and are designed to provide education and management suggestions to help individuals monitor their symptoms and to execute their care plan.

OBJECTIVES: Primary objective: To identify and summarize potential benefits and limitations of using mobile apps for asthma control through examining the available literature. Secondary objective: To suggest and advocate for topics to be incorporated into a standardized asthma care app.

METHODS: PubMed, Cochrane, and UT libraries databases were used to collect various studies that investigated the use of mobile, electronic apps, or portals to administer asthma education, care, and self-management.

RESULTS: Results from the literature review were conflicting; two studies that piloted asthma care apps found positive feedback from the patients and demonstrated improvement in asthma, and multiple small population studies revealed that using a form of electronic portal, app, or texting helped patients self-educate, manage, and adhere to their care plan. However, two systematic reviews that investigated the use of mobile apps to manage asthma found that there was no statistically significant difference in asthma control with the use of apps.

DISCUSSION: Asthma control requires patient compliance. The use of a mobile app to facilitate asthma management could take advantage of modern technology to provide convenient and reliable information, in an engaging format. Numerous small studies of asthma care apps have demonstrated their potential for management and control of symptoms. However, accessibility is a major consideration in app design.
CONCLUSION: There is still the lack of studies identifying and investigating a well-accepted, medically approved asthma care app and its effect on patients. Information consistency is a clear issue, as some apps may not be up to date or be in agreement with standardized asthma care guidelines. The creation of a standardized app could allow future research investigators to systematically investigate what aspects affect patients’ quality of life and asthma condition the most and could facilitate trust and continued usage by patients with asthma and their health care providers.

ANESTHESIA ASSISTANTS

41 ANESTHETIC TRACE GAS ANALYSIS
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The standards regarding the measurement of anesthetic trace gases are based on the values that were set in the late 1970s. Since these standards were created, there have been changes in anesthetic delivery devices and anesthetic techniques. The ability to measure operating room pollution resulting from anesthetic agents can be challenging. Do the standards that were set back in the late 1970s correlate with what can be done today’s anesthetic gas machine technology and techniques? Should the acceptable levels of pollution be the same as they were from 30–40 years ago? Or should the levels be adjusted to reflect how anesthesia practice has changed and how the equipment has changed too? The beginning of the talk will be a brief history on the practice of measuring anesthetic trace gases at three hospitals within Interior Health Authority. Also, the reasons of how and why anesthesia trace gas testing started, and the methods used to collect samples will be looked at. Two different techniques, one using a passive dosimeter and the other using an infrared gas analyzer, will be discussed. Samples collected and data obtained are then tabulated and reported in parts per million. Do each of these systems compare to one another when used side by side? The results will be compared between the two types of setups/systems used to measure the anesthesia trace gases. Further discussions of how often to test for waste gas pollution, what areas should be tested, how long the tests should last for, what to do with results if the values are high, and how should the results be stored are all topics that can be expanded on.

42 PROCEDURAL SEDATION: THE WHY AND HOW
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La sédation-analgésie comporte plusieurs enjeux important, de l’évaluation à la surveillance post intervention. Comme équipe interdisciplinaire, il est important de viser un degré optimal de sécurité et celle-ci doit posséder les compétences professionnelles pour y arriver. L’évaluation doit être complète, la salle et le matériel doivent être vérifiés et le moniteur adapté en fonction de la condition clinique du patient doit être disponible. Les interventions et la surveillance effectuées devraient également être consignées de manière rigoureuse. Pensez-vous être prêt à intervenir?

43 SUGAMMADEX: A REVOLUTIONARY REVERSAL OF NEUROMUSCULAR BLOCKADE
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Suggamadex is a fairly new pharmaceutical answer to the difficult bag mask, difficult-to-intubate emergency patient situation. It is fairly unfamiliar to most as it is not used very often and is quite expensive relative to other options. In this talk we will learn more about Suggamadex as well as other pharmacological solutions that are available for the difficult BMV/intubate patient population. The mechanism of action, distribution of drug, metabolism, and elimination will be discussed. Indications and contraindications of the drug, as well as an in depth comparison with other drugs used for reversal such as neostigmine will also be detailed. Furthermore, the use of Suggamadex and the fear of creating an era of “lazy anesthesia” will be discussed. The presentation will conclude with other induction techniques for the difficult to bag mask ventilate and difficult to intubate patients (i.e., high dose remifentanil instead of paralytic).

44 BOUGER À DOMICILE: REVE OU RÉALITÉ?
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Les maladies respiratoires, telles que la maladie pulmonaire obstructive chronique (MPOC), évoluent progressivement vers des complications systémiques pouvant nécessiter de l’oxygénothérapie. Ce déclin inévitable contribue également au déconditionnement, à la diminution des capacités fonctionnelles et de la qualité de vie des usagers, des conditions délétères pouvant être adressées par des programmes de réadaptation structurels adaptés. Étant donné leurs contraintes de mobilité, les usagers du Service régional de soins respiratoires spécialisés à domicile (SRSRSD) ont un accès limité aux programmes ambulatoires de réadaptation. Le SRSRSD s’est donc donné pour mission de développer un programme d’activité physique sécuritaire et individualisé afin de préserver la capacité fonctionnelle, la tolérance à l’effort, la qualité de vie et le contrôle des symptômes de dyspnée chez des usagers oxygénoédépendants.

L’objectif de ce projet pilote était donc de vérifier la faisabilité d’implanter un programme d’activité physique à domicile chez une clientèle oxygénoédépendante et d’obtenir des données cliniques préliminaires.

MÉTHODOLOGIE: En 2014, 50 patients de 50 à 91 ans nécessitant une oxygénothérapie à domicile avec suivi par le SRSRSD pour une maladie pulmonaire ont été approchés pour participer à ce programme de 12 semaines. La capacité fonctionnelle (Tuned Up and Go (TUG) et Five Times Sit to Stand Test (FTSSST)), la qualité de vie (COPD Assessment Test (CAT)), l’impact fonctionnel de l’essoufflement (MRC) et le niveau de confiance et de motivation à participer à ce programme ont été évalués avant et après le programme de 12 semaines. Deux guides d’enseignement créés par un groupe interdisciplinaire lors de ce projet ont permis aux intervenants d’orienter les patients vers un programme d’activité physique de faible intensité durant 12 semaines, adapté à leur condition physique et respiratoire. Les exercices proposés sollicitaient autant l’aspect cardiovasculaire que musculaire, avec une gradation d’intensité faible à intermédiaire.

RÉSULTATS: Sur 50 patients admis consécutivement au SRSRSD, 9 patients ont refusé dès le départ, 13 patients ont été décédés, 10 cessations de suivi par le SRSRSD et 4 autres exclusions ont été observées, laissant ainsi 15 patients pour initier et compléter le programme. Chez
ceux-ci, aucun événement indésirable n’a été recensé durant l’ensemble du programme. D’un point de vue clinique, aucune détérioration n’a été observée après les 12 semaines du programme, ni pour la capacité fonctionnelle, $\Delta \text{TUG et } \Delta \text{FTSST} = 0.37 \pm 3.68 \text{ secondes (p = 0.721)}$ et $0.47 \pm 3.52 \text{ secondes (p = 0.638) respectivement}$, ni pour les scores de qualité de vie $\Delta \text{CAT} = 0.4 \pm 7.1 \text{ points (p = 0.885)}$ et de dyspnée $\Delta \text{MRC} = 0.05 \pm 0.72 \text{ (p = 0.839)}$.

CONCLUSION: Les résultats obtenus lors du projet pilote supportent la faisabilité d’un tel programme et suggèrent que ce type de programme d’activité physique à domicile peut contribuer à maintenir la qualité de vie des usagers oxygénodépendants. D’autres études sont nécessaires pour confirmer les données concernant l’efficacité clinique d’un tel programme.

45
À CHACUN SON MASQUE
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Dans le marché actuel, il y a une quantité phénoménale de masques disponibles pour la ventilation non invasive. Malgré cette multitude d’opportunités, la problématique d’attribution et d’ajustement d’un masque afin d’optimiser la ventilation persiste. L’ajustement des masques demeure toujours un défi relativement au confort et à l’efficacité du traitement. Cette présentation permettra aux inhalothérapeutes de démystifier toutes les facettes de l’ajustement des masques, sans égard aux fabricants.
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should only prescribe BREO® ELLIPTA® (fluticasone furoate/vilanterol) 100/25 mcg and BREO® ELLIPTA® 200/25 mcg are indicated for the once-daily maintenance treatment of asthma in patients aged 18 years and older with reversible obstructive airways disease.

BREO® ELLIPTA® is not indicated for patients whose asthma can be managed by occasional use of a rapid onset, short duration, inhaled beta₂-agonist or for patients whose asthma can be successfully managed by inhaled corticosteroids along with occasional use of a rapid onset, short duration, inhaled beta₂-agonist. BREO® ELLIPTA® is not indicated for the relief of acute bronchospasm.

Contraindications:
- Patients with severe hypersensitivity to milk proteins.
- In the primary treatment of status asthmaticus or other acute episodes of asthma.

Most Serious Warnings and Precautions:

ASTHMA-RELATED DEATH: Long-acting beta₂-adrenergic agonists (LABA), such as vilanterol, increase the risk of asthma-related death. Physicians should only prescribe BREO® ELLIPTA® for patients not adequately controlled on a long-term asthma control medication, such as an inhaled corticosteroid, or whose disease severity clearly warrants initiation of treatment with both an inhaled corticosteroid and a LABA. Once asthma control is achieved and maintained, assess the patient at regular intervals and do not use BREO® ELLIPTA® for patients whose asthma can be adequately controlled on low- or medium-dose inhaled corticosteroids.

Other Relevant Warnings and Precautions:
- BREO® ELLIPTA® should not be used for the relief of acute symptoms of asthma (i.e., as rescue therapy for the treatment of acute episodes of bronchospasm).
- Patients who have been taking a rapid onset, short duration, inhaled bronchodilator on a regular basis (e.g., q.i.d) should be instructed to discontinue the regular use of these drugs and use them only for symptomatic relief if they develop acute symptoms while taking BREO® ELLIPTA®.
- BREO® ELLIPTA® should not be initiated in patients with acutely deteriorating asthma, which may be a life-threatening condition.
- Exacerbations may occur during treatment. Patients should be advised to continue treatment and seek medical advice if symptoms remain uncontrolled or worsen after initiation of therapy.
- BREO® ELLIPTA® should not be used more often than recommended, at higher doses than recommended, or in conjunction with other medicines containing a LABA, as an overdose may result.
- Caution in patients with cardiovascular disease: vilanterol can produce clinically significant cardiovascular effects in some patients as measured by an increase in pulse rate, systolic or diastolic blood pressure, or cardiac arrhythmias such as supraventricular tachycardia and extrasystoles. In healthy subjects receiving steady-state treatment of up to 4 times the recommended dose of vilanterol (representing a 10-fold higher systemic exposure than seen in patients with asthma) inhaled fluticasone furoate/vilanterol was associated with dose-dependent increases in heart rate and QTc prolongation. Use with caution in patients with severe cardiovascular disease, especially coronary insufficiency, cardiac arrhythmias (including tachyarrhythmias), hypertension, a known history of QTc prolongation, risk factors for torsade de pointes (e.g., hypokalemia), or patients taking medications known to prolong the QTc interval.
- Effects on Ear/Nose/Throat: localized infections of the mouth and pharynx with Candida albicans have occurred.
- Endocrine and Metabolic effects: possible systemic effects include Cushing’s syndrome; Cushingoid features; HPA axis suppression; growth retardation in children and adolescents; decrease in bone mineral density.
- Hypertension and adrenal suppression (including adrenal crisis) may appear in a small number of patients who are sensitive to these effects.
- Adrenal insufficiency: particular care should be taken in patients transferred from systematically active corticosteroids because deaths due to adrenal insufficiency have occurred during and after transfer to less systematically available inhaled corticosteroids.
- Bone effects: decreases in BMD have been observed with long-term administration of products containing inhaled corticosteroids.

Effect on growth: orally inhaled corticosteroids may cause a reduction in growth velocity when administered to children and adolescents.

Monitoring recommendations: serum potassium levels should be monitored in patients predisposed to low levels of serum potassium. Due to the hyperglycemic effect observed with other beta-agonists, additional blood glucose monitoring is recommended in diabetic patients. Monitoring of bone and ocular effects (cataract and glaucoma) should be considered in patients receiving maintenance therapy. Patients with hepatic impairment should be monitored for corticosteroid effects due to potentially increased systemic exposure of fluticasone furoate.

- Use with caution in patients with convulsive disorders or thyrotoxicosis and in those who are unusually responsive to sympathomimetic amines.
- Hematologic effects: may present with systemic eosinophilic conditions, with some patients presenting clinical features of vasculitis consistent with Churg-Strauss syndrome. Physicians should be alerted to eosinophilia, vasculitic rash, worsening pulmonary symptoms, cardiac complications, and/or neuropathy presenting in their patients.
- Hypersensitivity effects: immediate hypersensitivity reactions have occurred after administration, and patients should not re-challenged with BREO® ELLIPTA® if it is identified as the cause of the reaction. There have been reports of anaphylactic reactions in patients with severe milk protein allergy with other inhaled dry powder drug products containing lactose.
- Immune effects: greater susceptibility to infections. Administer with caution and only if necessary in patients with active or quiescent tuberculosis infections of the respiratory tract; chronic or
Hematologic effects: may present with systemic reactions have occurred after administration, and neuropathy presenting in their patients. 

Pulmonary symptoms, cardiac complications, and/or presenting clinical features of vasculitis consistent with eosinophilic conditions, with some patients unusually responsive to sympathomimetic amines. 

Hyperglycemic effect observed with other beta-derivatives; and acetylsalicylic acid. 

Administer with caution and only if necessary. 

Allergy with other inhaled dry powder drug products in patients with severe milk protein reactions in patients with severe milk protein.
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The CSRT and its industry partners have worked together to provide respiratory therapists with diverse methods to increase their knowledge, skills and abilities. With the ongoing collaboration and support of our industry partners, the CSRT will continue to create opportunities, tools and resources to improve patient care and health outcomes.

The CSRT values and appreciates the ongoing support from these CSRT corporate members.