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I’d like to take this opportunity to welcome those of you who are new members of the Respiratory Therapy Society of Ontario and thank those of you who are renewing or returning as members. Our partnership with the Canadian Society of Respiratory Therapists has offered a unique opportunity for those of us practicing in Ontario and the RTSO Board of Directors is hopeful that your membership offers you the value and benefit that we are striving to provide.

As volunteers, this is often difficult due to our own work, family, school and general life commitments but we believe that we are succeeding in the rebirth and growth of the RTSO.

The last quarter has been an active one. We have made several replies and responses to the Ministry of Health and Long Term Care regarding a number of new or amended Acts. These include a response to the Ontario Seniors Secretariat regarding amendments to the Retirement Home Act and one to the Health Professions Regulatory Policy & Programs Branch regarding proposed amendments to regulations relating to the practice of nurse practitioners in Ontario. Changes to the Retirement Home Act may have an effect on RTs working in the community and the regulation amendments for nurse practitioners were expanded allowances for lab orders. These retorts have been a result of a direct invitation from the Ministry requesting an input or response or one that has resulted from a request from the RTSO membership.

The RTSO has also made a response to the recent radio advertisements developed by HealthForceOntario. Our correspondence offered our sincere congratulations and appreciation to HFO regarding their recognition of the role that allied health professions have played in healthcare delivery in Ontario. Encompassed in the original letter, and two subsequent follow-ups, was a request for the addition of Respiratory Therapists in any future advertising campaigns. Unfortunately to date, we have yet to receive any confirmation of our inclusion.

In January, the RTSO executive met with the executive members of the College of Respiratory Therapists of Ontario. This joint-executive meeting offers an occasion for both administrations to discuss issues pertaining to the practice of Respiratory Therapy. More importantly, it allows both parties an opportunity to raise awareness of recent achievements or new mandates within our organizations. As well, it provides a forum to discuss opportunities to work in collaboration. At this time, on behalf of all members of the RTSO, I’d like to take this opportunity to acknowledge and commend the CRTO for taking the initiative to develop and implement the upcoming RT Summit in May 2011. This summit will engage Respiratory Therapists from across the province to discuss the scope, goals and future of our profession in Ontario.

For those of you who may not be aware, the RTSO has become an active partner in a new research project that has recently been accepted by the Canadian Institutes of Health Research (CIHR) Partnerships for Health System Improvement (PHSI) program. This project entitled “Understanding Long-Term Mechanical Ventilation in Canada: A Programmatic Approach” will require the expertise and involvement of interested RTSO members. Further detail of this project can be provided by Mika Nonoyama at mika.nonoyama@utoronto.ca.

The RTSO continues to make headway in developing relationships with like-organizations. Cystic Fibrosis Canada (CFC) has partnered with the RTSO to offer an article within this edition of the RTSO Airwaves detailing CF and the lives of individuals living with CF. This is a timely article as May is the month that CFC utilizes to raise awareness of cystic fibrosis. As well, the Trillium Gift of Life Network has agreed to offer a series of articles to broaden the knowledge base of those RRTs who may potentially find themselves caring for a donor patient. These articles, for all intents and purposes, are simply to raise awareness...
and understanding. The TGLN staff and coordinators are readily available if greater or more detailed information is desired.

As you will note by this issue of the RTSO Airwaves, our journal has grown exponentially over the past two years and much of this success can be attributed to those members of the RTSO who have volunteered their time to share their insight or experiences. As well, our corporate sponsorship has continued to strengthen and it is only through their support that the RTSO is able to provide the services we are attempting to provide to our membership. This includes our fall forum that is planned for September 30 to October 1st in Mississauga. Mike Keim, Rob Bryan and the other volunteers on the forum committee have done an exceptional job securing world-class speakers. The planned dinner, awards banquet and dance also promises to be an evening to be remembered. We are confident that the entire Inspire 2011 forum experience will be one that will surpass all others ever coordinated by the RTSO.

In closure, I would like to offer my thanks to all of you who have written, e-mailed or expressed your positive comments to the RTSO. I would also like to extend our appreciation to those of you who have shared a story, written an article, volunteered your time or simply promoted the RTSO to your peers. Like each of you, we are true believers of our profession. We know the difference we can make in healthcare delivery. The rebirth and growth of the RTSO has strengthened our collective voice and offered opportunities for RRTs across the province to share their knowledge, offer their assistance to each other, work in collaboration and unify our profession. This has always been one of our primary goals and we thank you for helping us to achieve it.

This year’s RTSO education forum, Inspire 2011, is scheduled for September 30 – October 1, 2011 at the Mississauga Delta Meadowvale Resort and Conference Centre. The conference is beginning to take shape and I am optimistic that the work of the planning committee will once again provide you with an experience to remember.

Inspire 2011 includes topics in acute neonatal/pediatric care, adult critical care and community health care. In addition, a social event Friday evening will include a guest Speaker. Ed Staniowski is a current Lieutenant Colonel in the Canadian Forces and a former NHL goalie with the St Louis Blues. Following our guest speaker will be the Achievement Awards presentation. A live band rounds out the evening for networking with friends and colleagues.

Don’t be the one who simply hears about “how great the conference was” from your colleagues after the event, plan today to attend.

Mike Keim, RRT
RTSO Board Director

### INSPIRE 2011 - RTSO EDUCATION FORUM
**SEPTEMBER 30 - OCTOBER 1, 2011**

**Feel Empowered by Dynamic Speakers & Topics**

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**Vendor Displays on Site Both Days**

*Note: The agenda is subject to change as a result of conditions beyond the control of the RTSO.*
Thank You to Our Contributors

This issue of RTSO Airwaves was made possible by the contributions of

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Charge Respiratory Therapist
The Tracheostomy Team
St. Joseph's Health Centre,
Toronto
Pg. 25

Jason Nickerson, RRT
RT Spotlight
Pg. 32 e

Tom Piraino RRT
Best Practice Clinical Educator
St. Joseph's Healthcare, Hamilton
"Lung Protective Ventilation: Future Direction for Randomized Controlled Trials" - Pg. 15

Jodi Rushton, RRT
"I Won't Catch TB"
Pg. 34

Robert Simms
Mobility Manager, Respiratory Care
Draeger Medical Canada Inc.
"The History of Ventilation Technology"
Pg. 6

Kimberly Todd
Southmedic Incorporated
"Technology That Breathes Innovation!"
Pg. 18

Yvette Webb, RRT
Hospital Account Manager
McArthur Medical
'Digital Transcutaneous CO2 Monitoring - Transitioning from a Useful Tool to Part of Daily Routine.' - Pg. 12

Editor - Dave McKay, RRT, RTSO President
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The Allied Health Professional Development Fund (AHPDF)

The Allied Health Professional Development Fund (AHPDF), now in its’ fifth year, is a resource established through Health Force Ontario. The fund supports the members of nine Ontario allied health disciplines, including Respiratory Therapists, with up to $1500 per year to apply to personal professional development activities; e.g. tuition or professional conference fees.

The intent of this fund is to “support the development of skills and enhance knowledge and leadership capacity among allied health professionals.”

The fund seeks to achieve 5 primary objectives:

- Enable more health care professionals to access professional development
- Expand current skills and leadership capacity to improve healthcare service quality
- Facilitate the retention of valued allied health professionals in Ontario
- Assist allied health professionals to adapt to changing expectations and health care needs
- Maintain and build Ontario’s capacity as a competitive employer

An AHPDF committee, consisting of representatives from each of the 9-allied health professional associations and regulatory bodies, administers the activity of this fund.

The AHPDF website can be accessed at http://www.ahpdf.ca/en/home

RTSO Research Project Partnership – Successful Funding Announcement

Understanding Long-Term Mechanical Ventilation in Canada: A Programmatic Approach

“IT is with great pleasure that the RTSO wishes to announce that a research project entitled “Understanding Long-Term Mechanical Ventilation in Canada: A Programmatic Approach”, was successfully funded by the Canadian Institutes of Health Research (CIHR) Partnerships for Health System Improvement (PHSI) program. The Respiratory Therapy Society of Ontario (RTSO) is a partner for this important research project. Over the next 3 years the RTSO will provide 1) expertise in the area of long-term mechanical ventilation and 2) an avenue for disseminating important information to all RTSO members. We will keep you updated as the study progresses. However if you want further information on this exciting project, contact Dr. Mika Nonoyama RRT PhD at mika.nonoyama@utoronto.ca.

About the research project: The number of individuals that require prolonged and long term mechanical ventilation (PMV/LTMV) as a result of acute illness or progression of chronic disease continues to rise. Currently, in the Canadian health care system, there is insufficient capacity to deliver care to ventilator-assisted individuals in both the acute and chronic care sectors. As well, significant barriers exist to the negotiation of a transition point in the health care system e.g., transitioning from acute to chronic care needs. This results in suboptimal care, decreased quality of life for individuals and their families, and inappropriate use of expensive and limited acute care resources. This project, developed through consultation with multi-professional experts in mechanical ventilation, will enable and inform seamless integrated care, the development of clinical best practices, the identification of health information needs of patients and families and the description of health care use and costs.

We propose to explore these issues for individuals (a) at-risk for LTMV in the community, (b) requiring LTMV in the community, (c) requiring PMV/LTMV in an institution and (d) transitioning from paediatric to adult care requirements. We will conduct our project in four stages. We will meet our study objectives through the conduct of expert surveys to define key transition points, the development of a national inventory of providers of services to individuals at risk or requiring PMV/LTMV, national surveys, and interviews of patients and families. Through the conduct of this project, we will establish a national network focused on improving care delivery for our target population, thus promoting collaboration and partnerships across health sectors, professions, and jurisdictions. As well, we will focus on sharing best practice initiatives to improve health outcomes, patient safety, and quality of life for our target population across the continuum of care.
Inspiration through Education... Learn more, breathe better
ORCS Eastern Ontario Region                Ottawa, Ontario
Tuesday, June 14, 2011              8:00 a.m. - 4:00 p.m.

• TB, Tobacco and COPD: Conflicting Epidemics - Dr. Gonzalo Alvarez
• The Basics of Chronic Disease Self-Management - Donna Cousineau and Laurie Taylor
• The Lung Association’s Shortness of Breath Exercise Maintenance Program - Rosario Holmes
• New Modes of Mechanical Ventilation - Denis Binette
• New Medications for Asthma and COPD - Dr. Steven Bencze
• Theme - When you can’t breathe: Diagnosis and Management of Dyspnea
  • Differential Diagnosis of Dyspnea - Dr. Khadija Bhimji
  • Panel - Managing Dyspnea...
    • in the Emergency Room - Louise Chartrand
    • in Respiratory Rehabilitation - Lyne Lavallée
    • in Palliative Care - Lynn Kachuki
• Dyspnea Case Study - facilitated by Dr. Judy King

Building T, Room T-102, Algonquin College
1385 Woodroffe Avenue, Ottawa

Educational Evening and Annual General Meeting
ORCS Greater Toronto Region           Toronto, Ontario
Thursday, June 16, 2011               5:00 - 8:00 p.m.

• Wake Up, get Up and get Out Early – Physical Medicine and Rehabilitation in the ICU - Dr. Eddy Fan
• Skeletal Muscle Dysfunction in COPD - Dr. Sunita Mathur

1st Floor Eaton Wing, Room 429-430, UHN, Toronto General Hospital
200 Elizabeth Street, Toronto

Spring Inspirations
ORCS Southwestern Ontario Region      London, Ontario
Thursday, June 23, 2011         8:00 a.m. - 4:00 p.m.

• Impact of Asynchrony on Patients Requiring Mechanical Ventilation - Dr. Karen Bosma
• Challenges of Critical Care Transport - Michael Kennedy and Dr. Mike Lewell
• Managing Dyspnea in Patients with Advanced COPD - Dr. Robin McFadden
• Chronic Respiratory Disease Management in the Community - Maria Savelle
• Rapid CT Chest Interpretation - Dr. Dalilah Fortin
• The Emerging Role of Inflammation in COPD - Dr. Jim Lewis
• Ventilation Outside of the ICU - Dr. David Leasa

Best Western Lamplighter Inn
591 Wellington Road South, London
For Dräger, the history of ventilation is more than a sober chronological list – the history of ventilation is closely linked with the history of the Dräger family. One hundred years ago in October 1907, company founder, Johann Heinrich Dräger, was awarded a patent for the Pulmotor, the first mobile short-term respirator. This marked the birth of ventilation technology development at Dräger. Simple, reliable, and extremely effective, the apparatus – transported in a wooden casket – quickly became a standard piece of equipment used by rescue services throughout Germany.

It all began early in the 20th century, when, on a trip to England, Johann Heinrich Dräger witnessed a young man being pulled out of the Thames and resuscitated using the traditional Schaeffer method. Still in London, Dräger then produced some initial sketches. Upon returning to Lübeck, he began developing a technical solution for a resuscitation machine. After a few more modifications, the result was “Dräger’s Pulmotor, the first automatic oxygen resuscitation machine for artificial respiration”, manufactured in the factory and construction institute for oxygen apparatus known at the time as Drägerwerk in Lübeck, Germany. In his memoirs, Johann Heinrich Dräger spoke of the Pulmotor as having enabled well over 1,000 officially attested resuscitations by March 1, 1917.

Successful attempts at resuscitating miners poisoned by carbon monoxide, for example, paid testament to the success of the oxygen machine just a short time after its market launch in 1908 – in defiance of the skeptics of positive pressure respiration. Dräger consequently started serial production which, even at that time, proved extremely successful in the United States. The first Dräger company on US soil was founded in 1907, too: at 11 Broadway in New York City; shortly afterwards, the company was moved to Pittsburgh, PA, and renamed Draeger Oxygen Apparatus Company. Internationality and innovativeness have a long tradition at Dräger.

In the US, the Pulmotor respirator was bought mainly to equip rescue teams of mining companies (mine rescuers) and fire departments, hence Dräger’s legendary reputation for breathing apparatus in the US: mine rescuers equipped with Dräger apparatus were known as Draegermen.

The Oxylog product family, which is still going strong today, superseded the successful Pulmotor in 1978. After the first applications of the Iron Lung in the fifties, long-term positive pressure ventilation was introduced. Today, this is fulfilled by the intensive care ventilators of the Evita family. All of these devices are based on the technical specifications of the Pulmotor. In fact, advancements in this technical innovation from the beginning of the 20th century are now not only used for emergency and long-term ventilation, but also in anesthesia and for home care.
"Zero Hour" in Machine Ventilation – The “Original Pulmotor”

Machine ventilation uses mechanical aids and oxygen to support insufficient spontaneous breathing. A ventilator ventilates the lungs with a ventilation pattern, a defined period of pressure and volume, thereby creating machine-supported breathing. Ventilators must be equipped with a control method and generally use oxygen for ventilation.

Hence two skills were required to develop ventilators. The designers had to know about control principles and they had to be familiar with pressure gases. Both prerequisites were fulfilled at the beginning of the last century in the still very young company of “Heinrich & Bernhard Dräger” and the development of a ventilator was a top priority in the truest sense of the word.

In his publication “The Development of the Pulmotor” company founder Heinrich Dräger documented his ideas about developing a ventilator. He described a new technology for “blowing fresh air or oxygen into the lungs.” His Pulmotor created positive and negative airway pressure alternatively and was powered by oxygen under pressure. In 1907 Heinrich Dräger was awarded the patent for developing his “original Pulmotor.”

The Control Principle of the Original Pulmotor

To switch between inhalation and exhalation, Heinrich Dräger used a mechanism in his original Pulmotor that he was very familiar with from his work as a skilled watchmaker. The ventilation pattern was controlled with a modified movement with a cam disc.

It is remarkable that Heinrich Dräger choose this control principle of the “Original Pulmotor.” He selected a technical principle which would replace nature as closely as possible. By setting the objective of imitating nature for artificial ventilation, he was way ahead of his time.

For Heinrich Dräger, the physiological function that needed to be replaced was the regular movement of the lungs with a constant time pattern. Therefore he selected a technical principle for his ventilator, guaranteeing a constant length of inhalation and exhalation during artificial ventilation. In modern terms, ventilation was time cycled.

The rest of the world, as well as those who continued to develop the Pulmotor further, followed another principle. Ventilation patterns were controlled by a technical principle which switched between inhalation and exhalation when a certain ventilation pressure was reached. These systems are pressure cycled. Pressure-cycled ventilation devices became more robust, more reliable and precise - in short - technically improved. Pressure-cycled ventilation devices seen from today's point of view are technically optimized. They followed a path which at the time was more readily achievable technically.
Here Heinrich Dräger was - ahead of his time. Modern ventilators are not pressure cycled but are mostly time cycled. However, we do not know whether Heinrich Dräger knew then that his principle was closer to human physiology than others. The fact remains that his Pulmotor, patented in 1907, led the way with its timing control.

**Subsequent Development of the Pulmotor by Bernhard Dräger**

The “Proto-Pulmotor” was certainly a ground-breaking concept but it remained on the level of a prototype that needed to be further developed for practical use. It had two faults which Heinrich Dräger recognized and documented during development. Firstly his construction caused considerable re-inhalation of exhaled gas. Secondary the breathing pattern could not be adapted to the patient due to the inflexible control of the movement. Heinrich Dräger left it to his son Bernhard and engineer Hans Schröder to find a remedy for these defects.

Bernhard Dräger solved the problem of re-inhalation of exhaled gas by redesigning the valve system that controls the flow of breathing gas to the patient. In the “original Pulmotor” the patient was connected to the ventilator only by a tube. This tube worked to a certain extent as an extension of the trachea since the inhalation and exhalation air was only separated inside the ventilator.

Bernhard Dräger replaced the connecting apparatus of the “original Pulmotor” with a tube system consisting of an inhalation tube and exhalation tube. By alternating the valve control, the patient’s inhaled and exhaled air could be separated thereby greatly reducing the exhaled carbon dioxide contamination of the inspiratory air.

**The Pulmotor Dispute (1)**

Only five years after the start of production in 1908, 3,000 Pulmotors were in use – an enormous number at that time. Ten years later, the number of Pulmotors had doubled to almost 6,000 and after 38 years the number was estimated at more than 12,000. The resuscitations performed with the Pulmotor were documented with meticulous exactitude by Drägerwerk and published with great pride in the Dräger magazines.

There was a very obvious interest behind this publicity activity by Dräger. They wanted to prove to the public that resuscitation via machine-supported ventilation was superior to a manual method. They defended themselves against criticism of the principle of high pressure ventilation used in the Pulmotor, a criticism which was levied by clinical users in the 1920s and came to a climax in the so-called “Pulmotor dispute”.

A Pulmotor, at the time, worked with a ventilation pressure of 20 cmH2O in the inhalation phase and a negative pressure of -25 cmH2O in the exhalation phase. To stimulate the respiratory center an admixture of CO2 was used. This meant that, with the exception of the ventilation pressure in the inhalation phase, ventilation at the time differed considerably from methods today and the criticism of the clinic is at least understandable from today’s point of view. But the interesting thing is that the dispute concentrated mainly on the supposedly dangerous effects of the ventilation pressure on heart and lungs – the much more questionable negative pressures or the CO2 admixture, as we know today, attracted very little interest.

**The Pulmotor Dispute (2)**

In 1922, the Department of Health as the then regulatory agency took the decision, based on the available knowledge, that there were no objections on health
The History of Ventilation Technology

The ventilation pressures of the new Pulmotor were +15 mbar for inhalation and -10 mbar for exhalation. The enrichment in the inspiratory gas, which was available optionally in the previous models as a supposed simulation of the patient’s own breathing was no longer provided for the new Pulmotor. Instead, it was replaced by a pneumatically-driven suction device.

Apart from the standard case version, which was introduced as the PK2 model, the satchel version PT1 was also introduced. The latter weighed only 13 kg, slightly more than half the weight of the earlier cased version of the Pulmotor. The PK 60 and PT60 or PT61 models were enhanced models where a modified Pulmotor case provided pure oxygen ventilation without an intake of ambient air and for the first time made ventilation in a toxic atmosphere possible.

The Pulmotor in Clinical Applications

For several decades the Pulmotor was an independent product series. Its main area of application was emergency resuscitation. In addition, the Pulmotor principle was used in various ventilation devices, mostly under another name.

As early as 1910 the Pulmotor principle was used in the “Dräger Ventilator type MOA” fitted with a switching mechanism using a control bag and a simple airway gas humidifier. In 1913 the Lung Gymnastic Apparatus Type MSA followed, fitted with a pedal to switch between the inspiratory phases. A mobile version of the Pulmotor was available as early as the 1920s.

The remarkable clinical version of the Pulmotor was the Poliomat which was fitted with the newly developed Pulmotor canister as early as 1953. In contrast to the Pulmotors, which were developed for short-term use, the inspiratory pressure in the Poliomat was not set in the factory but could be determined by the operator. In addition, inspiratory frequency and volume could be adjusted via control valves. Both the inspiratory pressure and the ventilated volume could be read from the instruments. The Poliometer was fitted with an inspiratory pressure meter and a volumeter.

For conditioning the airway gas, Dräger used a technique which was already used successfully for mine rescues. Nickel filter packages were used to humidify and warm the inspiratory gas. The humidity in the exhalation air condensed in the filters and this condensate was used to humidify the inspiratory gas in the inhalation phase.

With the adjustment options for the inspiratory parameters, the measuring devices and the inspiratory
The History of Ventilation Technology

gas conditioning, the Poliomat was fitted with the most important features of later intensive care ventilators. However, the Poliomat with its Pulmotor principle faced competition from other types of apparatus in the market to cover the enormous demand for ventilators after the Second World War.

The Beginning of Intensive Care Ventilation – Assistors

In the 1950s, a new perception in clinical investigation brought about a new attitude in ventilation therapy. Faulty treatment and complications were frequently caused because medical staff had to rely more on subjective clinical impressions when assessing ventilation rather than exact measuring parameters. Without knowing the exact ventilation volumes administered, the set volumes could injure patients. Either patients suffered from inspiratory gas insufficiency or they were exposed to high stress by unnecessary intensive care ventilation.

New findings, in particular from Scandinavia, led to positive pressure ventilation with its superior ventilation control becoming important once more. Two lines of thought were followed: The first line was a further development of pressure cycled ventilation which in later versions was completed by measuring devices for ventilation volumes. In a second line new concepts were established with a setting of constant ventilation volumes.

For these new application areas, Dräger developed various ventilation apparatus which existed side by side for a time. In the field of pressure-cycled ventilation, the Assistor series developed further the successful principle of the Pulmotor. A common characteristic of the Assistors, apart from pressure regulation, was the possibility to assist spontaneous breathing, i.e., the patients could initiate mechanical breaths with their own attempts at spontaneous breathing.

The timer for delivering mechanical breaths on the Assistor 641 was pneumatically driven; in the Assistor 642, it was powered by electricity. With the Assistor 644, the length of use was extended with a new system of inspiratory gas conditioning and the circle of patients extended to pediatric applications. The Assistor 744 improved ventilation quality, in particular in pediatric applications, with a more sensitive trigger mechanism which meant easier activation of machine-assisted ventilation. Furthermore, the appearance of the early assistors, which took some getting used to, was improved. A user-friendly but esthetic product design was becoming increasingly important when developing medical equipment.

The Road to Modern Intensive Care Ventilation

The assistors extended the area of application of ventilation considerably. In addition to ventilation for polio patients, post-operative ventilation and inhalation therapy for chronic lung disease became common. Despite the expansion of the range of applications, machine-assisted ventilation remained a relatively simple measure.

However, modern ventilation goes one step further. It does not function simply as a bridge during a period of breathing insufficiency, rather it adapts the type of ventilation to the cause of the dysfunction and where possible treats the dysfunction in a targeted manner. Modern ventilation is respiratory therapy.

The requirements of targeted intensive therapy meant new demands on ventilators. In particular users were looking for control over the ventilation volume. Furthermore, the length of ventilation time should be variable by adjustable parameters and not simply be dependent on the lung mechanics of the patient. Time-cycled, constant-volume ventilation was required.

The first Dräger ventilation devices which fulfilled these requirements were the Spiromat series, introduced in
1955. They marked the starting point in the development of modern intensive ventilator equipment at Dräger.

**From the Pulmotor to the Oxylog®**
The limits of pressure-assisted ventilation in intensive care ventilation had been recognized in the 1950s and had led to the development of the time-cycled constant-volume ventilators. This development did not reach the field of emergency ventilation until two decades later. At Dräger it led to the development of a completely new emergency ventilation device launched in 1976 under the name of Oxylog®.

The operational system was completely new compared to the Pulmotor. Instead of the pressure-cycled switching mechanism, a pneumatic logical control was used. The new pneumatics not any more delivered constant flow which could be directed to the patient or into the ambient atmosphere; it also delivered the inspiratory gas only during the inhalation phase and discontinued the flow during the exhalation phase, thus creating an intermittent flow. This principle is called a “flow chopper”.

Using this new operational principle time-cycled constant-volume ventilation was now possible in emergency medicine. The minute volume could now be adjusted directly on the device and it remains constant during ventilation, ensuring guaranteed ventilation required by users. Ventilation frequency could also be adjusted freely on the device and hence ventilation adjusted to heart resuscitation. The frequency also remained constant throughout use and did not have to be adjusted when the oxygen concentration was changed, in contrast to the Pulmotor. Stenoses could be recognized directly on a ventilation pressure gauge – whereas the Pulmotor users had to rely on someone interpreting the quick switch and the “rattle” correctly. In addition, the control unit used barely one liter of pressurized gas per minute, a considerable savings, compared to the Pulmotor.

Given all these advantages the Oxylog should have rapidly displaced the Pulmotor on the market – but things turned out very differently. A conversion kit gave customers with a PT60/61 or a PK 60 the possibility to replace the Pulmotor canister with an Oxylog. This meant that customers buying a new Oxylog could continue to use the accessories of the Pulmotor such as the satchel and the oxygen bottle. This led to a long transition period lasting several years when the Oxylog was used in conjunction with Pulmotor logistics.

**Modern Intensive Care Ventilation –**

**The Evita Series**
The introduction of the Evita series in 1985 saw further developments in computer technology applied to ventilation and enabled machine-assisted ventilation to be adapted even closer to spontaneous breathing. New performance characteristics of the Evita series were made possible by the rapid development of screen technology. Higher graphics resolution and color displays ensured improved information transfer via image and text. And progress in screen technology was not limited to displays. The Evita 4 used a touch-sensitive screen for the first time when it was introduced in 1995. This touch screen technology practically revolutionized the concept of functionality in ventilation terms.

An enormous number of new performance characteristics in therapy, monitoring and functionality were introduced with the Evita series and the market for ventilators became more sophisticated. Not all customers wanted the best – some wanted to concentrate on a few functions while others wanted more and more. In addition, Dräger was no longer producing simply for “the market” which traditionally had always been the national market. Now Dräger was concentrating its efforts increasingly on export markets with their varying requirements. Parallel product lines were introduced – Evita grew to become the Evita product family.

First came the Evita 2 dura in 1997 with a limited performance range compared to the Evita 4. The EvitaXL was introduced in 2003 with a markedly greater range than the Evita 4. However, the three members of the Evita product family are differentiated not only in their scope of performance but also in their innovation cycle, with the EvitaXL leading the way.

In 2009, the next generation of Evita was released, the Infinity® Acute Care Station Workstation Critical Care – Evita V500. The Dräger Infinity® V500 provides world class ventilation designed for patients of all ages and acuity levels. It is sophistication made simple, equipped with features that go beyond standard ventilation. The V500 is a highly advanced ventilator for use in modern, acute care respiratory support. Dräger has been making technology for life for over a century, and we firmly believe that an essential element of any successful health care strategy lies in choosing the right technology to accomplish your goals.

Excerpts from the book, “It began with the Pulmotor, One Hundred Years of Artificial Ventilation” by Dr. Ernst Bahms and Press release No 22e / 2007 Page 1 of 2 2007 – a special anniversary year for Dräger
It was in 1960 that Severinghaus mentioned measuring CO2 on human skin. It would be another 20 years before the first transcutaneous CO2 (tcCO2) sensor was commercially available for clinical monitoring. Over those 20 years, the development of the transcutaneous PO2 sensor and its correlation to arterial PaO2 was established. The next breakthrough was the use of local heating through the sensor to permit continuous monitoring.

In the era of “new transcutaneous monitoring” Respiratory Therapists were the keepers of the monitor and its functionality. Multiple daily calibration of sensors and frequent site changes were the standard practice as the technology was predominately used in neonatal units. Two point gas calibrations and room air references were used to calibrate the sensors. Sensors were re-membraned in exacting steps that often included soaking of the sensor, using a pencil eraser to remove build up on the PO2 Clark type electrode, and steady hands for placing a mylar type membrane over electrolyte and ensuring it was free of air bubbles. There were two sensors, one for CO2 and one for O2; then a combination sensor was available. The Oxygen and CO2 outside the sensor diffused across the membrane into the electrolyte. A tiny current was generated that was proportional to the pO2 the sensor was exposed to, and CO2 diffusing into the electrolyte changed its pH depending on the pCO2 to which the sensor was exposed. The current was amplified and transmitted to the monitor for calculation and display.

Over the next few years, transcutaneous monitoring expanded its original application for premature babies in the NICU. Transcutaneous CO2 became popular in sleep medicine. TcCO2 use in adult ventilator monitoring in the intensive care unit became well published and identified as useful. Clinicians were very comfortable with using blood gas measurements to assess patient’s ventilation in the adult ICU and TcCO2 never became an established practice.

Transcutaneous PO2 became an assessment tool for the identification of microcirculation/tissue ischemia in amputations, limb reattachment and skin flap surgeries. The availability of pulse oximetry overshadowed the use of TcPO2. As the “Fifth Vital Sign”, SPO2 expanded from the operating room, to the adult, paediatric and neonatal critical care units to the emergency department and to the general care wards. While in the late 1980’s, end tidal CO2 followed closely behind; first as a safety monitor in the operating room, then as a valuable monitoring parameter in intubated and non intubated patients. The end tidal CO2’s ability to provide information about CO2 elimination, transportation and production made it a standard of practice for all patients receiving general anaesthesia and is emerging as a standard of care in EMS, ER and intensive care. Challenges in end tidal CO2 correlation to arterial CO2 based on a patient’s a-A gradient and acid-base balance does not always provide good correlation to arterial CO2 and is not considered a good tool when precise CO2 monitoring is required.

A few changes were made in the design of the CO2 sensors. In 1990 the tcPCO2 sensors became solid state. In 2004 a new “digital” sensor technology was launched from SenTec AG in Switzerland. It provides a miniature CPU embedded in the sensor to permit rapid analysis of the minute current changes resulting in changes in the pH of the electrolyte as changes in CO2 occur. The digital V-Sign sensor weighs in at 3 grams and provides transcutaneous CO2 and pulse oximetry monitoring. Monitoring temperatures for adults is 42oC and for neonates 41oC thus reducing the incidence of skin irritation from the necessities of heating the sensor. The sensor requires only monthly membrane changes and calibration every 8 hours.
With extensive technology validation and its ease of use, digital transcutaneous CO2 monitoring is defining applications in ventilation monitoring in clinical areas. Neonatal units and sleep labs benefit from the sensor’s rapid response in CO2 changes. Adult critical care units are using the technology during HFO ventilation, weaning from ventilation and NIV ventilation where accurate CO2 monitoring enables respiratory therapists to titrate therapies appropriately instead of the “snap shot in time” from the blood gas. Rapid and reliable CO2 information has identified hypoventilation during bronchoscopy, and during conscious sedation and with oxygen delivery and nocturnal saturation monitoring. Initializing of NIV in the ER and rapid titration for COPD exacerbation can be readily accomplished with the SenTec. Transcutaneous CO2 monitoring is complementing ETCO2 in the operating room where ETCO2 remains the standard of care to monitor the ET tube placement, to be an adjunct ventilator monitor for disconnect and to provide a capnograph for analysis. TcCO2 is valuable for titrating ventilation during minimal invasive surgery, especially one lung procedures, during neurosurgery to maintain perfusion and during neonatal, paediatric or ENT surgeries with non cuffed tubes or jet ventilation.

The new digital technology for acquiring transcutaneous CO2 information requires far less maintenance and significantly improves reliability. Its very strong correlation to PaCO2 provides many opportunities to use as an essential monitoring device in your practice.

References:

SenTec Digital Monitoring System
Noninvasive and continuous monitoring of
- Carbon Dioxide Tension (PCO2)
- Oxygen Saturation (SpO2)
- Pulse Rate (PR)

SenTec Digital Monitoring System (SDMS) with V-Sign™ Sensor provides continuous, noninvasive, real-time monitoring of carbon dioxide partial pressure (PCO2), oxygen saturation (SpO2) and pulse. V-Sign™ Sensor is easily applied to the earlobe or - for PCO2 monitoring only - to a conventional PCO2 site. The SDMS responds quickly and accurately to changes in patient’s PCO2- and/or SpO2-levels in a variety of clinical settings from neonate to adult.
**Lung Protective Ventilation: Future Direction for Randomized Controlled Trials**

**Introduction**
For the past 11 years, we have referred to the Acute Respiratory Distress Network (ARDSNet) study of 2000 as the pivotal study for lung protective ventilation. The study compared traditional or "high" tidal volume with a more protective "low" tidal volume and minimal plateau pressure (Pplat) approach. The results changed the way we mechanically ventilate our patients in the ICU, and influenced a number of future studies aiming to improve patient outcomes even further. The overall popularity of the ARDSNet study overshadowed another study published 2 years prior to ARDSNet by Amato et. al. The Amato study appeared "irrelevant" most likely because of the mere size of the ARDSNet study (861 patients compared to only 53 patients in the Amato study). However, I think we missed some important findings with the Amato study that should have influenced further studies simply by their physiological concepts rather than generalizing their findings to guide further studies. Let's break things down and put them into context.

**Tidal Volume**
Based on the data from the journal "Nature" in 1963, all mammals have an average tidal volume of 6.3 ml/kg of predicted body weight. This data was published again in 2004. The results of the ARDSNet study, therefore, should not be very surprising; tidal volumes twice the size of normal lung physiology would cause excessive stress and subsequent injury. The question is, why did it take 861 patients to show a significant difference in a mortality of only 9%? Perhaps the answer lies in the general issues surrounding mechanical ventilation in ARDS. These issues are overdistension (which can occur with even low tidal volumes), atelectrauma (the cyclical opening and closing of alveoli due to insufficient end-expiratory pressure), and biotrauma (the cellular changes related to atelectrauma and overdistension).

Mechanical ventilation with tidal volumes of 12 ml/kg would most likely result in overdistension and subsequent biotrauma even in patients with mild lung injury. The issue of atelectrauma was not a primary focus in the ARDSNet study. The control group and the experimental strategy used similar PEEP levels (according to a PEEP/FiO2 table). As a result, none of the study groups had an advantage over the other. The potential complications and damaging effects of atelectrauma therefore were equal between the two groups.

**PEEP Selection**
If you have read my article in the previous Airwaves (Current Approaches to Setting Optimal PEEP), you will know that one method that is not used very often, due to certain limitations, is the Pressure-Volume Curve (P-V curve). The P-V curve can be used to determine the lower inflection point (LIP) otherwise known as Pflex. The Amato study, in essence, compared high and low PEEP but the study is considered irrelevant in that context because of the control arm (we know that high tidal volume increases mortality in ARDS!). However, what I feel is important to point out, is that in the context of high vs. low tidal volume (lung protection), I feel the Amato study offered a great value and should have set the stage for lung protective ventilation. Unfortunately it has not.

**Control Groups**
Similar to the ARDSNet study, the Amato study used high tidal volumes of 12 ml/kg and adjusted PEEP according to an algorithm. The average PEEP setting from days 2 to 7 was 9 cm H2O. The average PEEP level for the high tidal volume group in the ARDSNet study at 7 days was also 9...
cm H2O, making both control group strategies (Amato and ARDSNet) nearly identical. (Figure 2) One criticism the Amato study received was that they did not limit the Pplat, whereas the ARDSNet study limited them to 50 cm H2O. However, if you analyze the data during the first week, the Pplat were very similar. In the Amato study the average Pplat between days 2 to 7 was 37.8 cm H2O. (Figure 3)

Figure 2

Experimental Groups

Similar to the ARDSNet study, the Amato study used low tidal volumes as a lung protective strategy to limit high Pplat and overdistension. Interestingly, neither of the studies mentioned that 6.3 ml/kg is the average tidal volume of all mammals! The major differences between the lung protective strategies are the modes used during lung protective ventilation, and the method for PEEP selection. ARDSNet used the same PEEP titration table for both the control and experimental groups and Amato used Pflex to individualize PEEP in the lung protective group on day one, utilized lung recruitment maneuvers and provided support via pressure controlled (assist) ventilation. (Figure 4)

The Advantage

As mentioned earlier, the ARDSNet study took 861 patients to reach a statistical significant difference in mortality. The mortality difference was for “death before discharge home without breathing assistance”. If there were a statistically significant difference in mortality between the two groups before the 861 patients, the study would most likely have been terminated at an interim analysis. Keep in mind that this does not happen when a P-value is 0.05; it’s usually more of a critical significance that would cause termination of a study. In the case of ARDSNet, it reached a P-value < 0.005.

The outcome goal of the Amato study was ICU mortality at 28 days. Within the first 28 days there was a significant difference in mortality of 33% (compared to 9% in the ARDSNet study) between the two groups and the study was terminated. This reached a critically significant P Value of < 0.001 at only 53 patients. It was not surprising that due to the size of the study there was not a significant difference in the “survival to hospital discharge”.

Due to the fact that the ARDSNet study did not show data for 28-day mortality, it is difficult to compare the results side by side. Another difficulty comparing the two studies is the fact that the percentage of mortality in the ARDSNet study control group (high tidal volume) was 39%, and in the Amato study the control group had 71% mortality. However, keep in mind that the study only had 24 patients in the control arm versus 429 patients in the control arm of the ARDSNet study. Perhaps if the Amato study was not terminated so early, the overall number of patients may have allowed that mortality percentage to be quite different. Nonetheless, they used the same control arm strategy as ARDSNet.

The Amato study is mentioned during the discussion portion of the ARDSNet publication which says that the use of high PEEP may provide further benefit (**this is the
LUNG PROTECTIVE VENTILATION: FUTURE DIRECTION FOR RANDOMIZED CONTROLLED TRIALS

generalization I was referring to in the introduction, it was generalized as “high PEEP”, not individualized PEEP). The lung protective group in the Amato study had “high PEEP”, but it was chosen with a maneuver (Pflex) designed to individualize the PEEP setting, not a generalized or protocolled approach. The next large randomized controlled study published by the ARDSNet group was a high vs. low PEEP study where both the control and the experimental groups received 6 ml/kg tidal volume and limited Pplat. Unfortunately, this study failed to show a statistically significant difference in mortality. The criticism of that study is that the method used to set PEEP in both groups was a PEEP/FiO2 titration table, not lung mechanics.

Why the PEEP/FiO2 chart?
In a study protocol you need consistency; you need technology that is readily available and easy to interpret. A blood gas and a PEEP/FiO2 table is the easiest way to ensure consistency and encourage changes that may (or may not) benefit the patient. The criticism of the table always refers to its inability to individualize the needs of the patient according to lung mechanics. Lack of individualization could have been the reason why there was no significant mortality difference seen between high and low PEEP in more than one study, even with large sample sizes.6, 7

Randomized Controlled Trials Using Lung Mechanics
There have been two randomized controlled trials that I’m familiar with since the Amato study that used lung mechanics to guide the individualization of PEEP. Both of them had less than 100 patients enrolled due to the need to stop the trial early for critically significant P-values. One is the Villar study which was almost identical to the Amato study except they did not use recruitment maneuvers, and they waited for 24 before randomization to prevent the enrolment of patients that may not have met the ARDS criteria after 24 hours of standard ventilation settings. 8,9

In this study, there was a significant difference in mortality favouring the lung protective arm but unfortunately they utilized a high tidal volume control group and high tidal volume ventilation had already been frowned upon by the previously mentioned studies. The second study was the Talmor et. al study in 2008 that randomly assigned patients to have mechanical ventilation guided by transpulmonary pressure (estimated by esophageal pressure manometry) or have mechanical ventilation guided by the ARDSNet lung protective ventilation recommendations10. The biggest downside of this study was that the outcome goal was oxygenation, not mortality, and the study was terminated early because of a P-value of 0.002 (better oxygenation in the transpulmonary pressure group). There was a trend towards a decreased 28 day mortality in the transpulmonary pressure group, but lacked the sample size to show significance (P-value 0.055).

Summary and Future Direction
Despite the differences of the ARDSNet and Amato studies, the control strategies were virtually identical. The control strategy of lung protective ventilation using lung mechanics (Pflex) to set PEEP used in the Amato study provided enough evidence to influence further study. The more popular “high PEEP” studies that followed had many patients enrolled, used lung protective ventilation, but generalized high PEEP and ignored the individual lung mechanics of the patient.

I feel that the future direction of randomized controlled trials, based on available technology and our understanding of lung physiology, should be low tidal volume ventilation and current PEEP practice, which is typically the ARDSNet PEEP/FiO2 table or the arbitrary setting of PEEP without guidance by a table as compared to PEEP set according to lung mechanics (like the Talmor study). I feel that this should have been the direction of research and randomized controlled trials after the Amato study of 1998. For some reason, the results of that study were overshadowed by the ARDSNet study and it was unfortunately generalized as having a potential “high PEEP” benefit rather than what it really was... individualized mechanical ventilation.

Lisette (Lee) McDonald, an ICU nurse at Hamilton General Hospital, recognized a product need in the anesthesiology department of a major hospital. Lee designed, and with the aid of local toolmakers, produced a unique patented solution. In order to sell her devices to the hospital, she had to create a company. On March 7, 1983, Southmedic Inc. was born. Lee’s first sale of 10 Anaesthetic Interlocking Devices to the Hamilton General Hospital catapulted her into the business world. Initially, the product “Anaeslock,” was expected to serve only the local market, but the solution proved to be universal in nature. With the sale complete, Lee had every intention to return to her nursing career, but to her surprise orders for the Anaeslock kept coming in. Lee departed her nursing position to pursue her passion for improving health care through innovative products.

Back in 1983, banks would not finance a woman in business without guarantees and Lee simply had none to pledge. Lee’s first manufacturing facility and office was the basement of the McDonald’s home and within a few months she had her first employee. In spite of not having a firm marketing plan, sales for this product grew globally. Today, Southmedic has in excess of 160 employees, sales in over 60 countries and houses 60,000 square feet of manufacturing space in Barrie, Ontario. The corporation is now comprised of three unique business units: Proprietary Manufacturing, Contract Manufacturing and Domestic Distribution.

Lee owes a significant part of her success to her experience and skills as a critical care nurse. These origins are the source of her caring, focused, ‘no nonsense’ personality. No degree of planning or vision could have predicted this success; Lee simply had products, which addressed, and continue to address needs left unsatisfied by industry stakeholders. Her approach is simple: “Business is People, and when people are encouraged, rewarded and allowed to develop to their full potential, they grow - and so does the business!” She firmly believes that corporations should hire talented people and allow them the freedom to ask, “What would happen if?” This environment empowers the employee to make decisions, which in turn allows Southmedic to institute innovative changes quickly, to satisfy the needs of the customers.

A prime example of this was Lee’s identification of a shortfall in the global respiratory marketplace. Traditional oxygen therapy utilizes a variety of delivery devices during one hospital admission to achieve various FiO2 ranges. Historic oxygen mask technology is closed, uncomfortable and claustrophobic for patients. Southmedic’s OxyMask, introduced in 2005, overcame these common clinical issues, delivering FiO2 ranges from 24-90% using one mask. Key elements of the OxyMask are increased litre flow capabilities, a wider FiO2 range, mask adaptability to various facial features, an open concept and directional flow. Lee added two Respiratory Therapists to her specialized team who were assigned to clinical education and business development of this new technology.
OxyMask Technology

OxyMask™ uses a mushroom pin and precision angling diffuser system that produces velocity vortices at all flow rates—250ml -flush. The oxygen concentration levels exiting the diffuser pin assembly of the OxyMaskTM has been scientifically proven to deliver the widest range of FiO2 24% - 90%, which is higher than the sum total of the traditional devices. The vortex (flow) of oxygen molecules is directed perpendicular to the face, towards the mouth and nose unlike the classical devices, the typical Venturi mask or Non-Rebreather mask, which delivers flow parallel to the facial surface, ultimately directing the oxygen flow towards the eyes. Advantages of the open-mask design of the OxyMaskTM includes the elimination of the risks of CO2 rebreathing and delivery of Intrinsic PEEP on flow rates. The accumulation of oxygen molecules within the diffuser, through the critical formation of velocity vortices and the directional flow of these vortices towards the mouth and nose, position OxyMaskTM as an effective and efficient choice to administer oxygen therapy safely.

Southmedic’s success truly speaks for itself and our tenure in this industry is something we are very proud.
Cystic fibrosis (CF) touches the lives of many Canadians. It is the most common fatal genetic disease affecting Canadian children and young adults. One person dies from cystic fibrosis in Canada each week. There is no cure.

The disease causes a build-up of thick mucus in the lungs leading to severe respiratory problems. Mucus and protein build-up in the digestive tract makes it difficult to digest and absorb nutrients from food. The effects of CF are most devastating in the lungs and most CF deaths are due to lung disease.

Because cystic fibrosis is a disorder that affects several bodily systems, it is associated with a variety of symptoms, including: difficulty breathing, persistent coughing that expels thick mucus, digestive problems, skin that tastes unusually salty, and frequent respiratory tract infections.

Cystic fibrosis affects each individual differently, with varying degrees of severity. Each person with the disease follows an individualized treatment program, which may include a demanding daily routine of physical and, sometimes, inhalation therapy to keep the lungs free of congestion and infection. Children and adults with CF must consume a large number of pancreatic enzymes (on average 20 pills a day) with every meal and snack, to help obtain adequate nutrition from food. Regular visits to a CF clinic are also an essential part of care and treatment. In addition, many individuals with CF have other health complications, such as CF-related diabetes.

Shannon Price is a 36-year-old who has cystic fibrosis, chronic sinusitis, asthma and diabetes. Each day, she goes through hours of treatment, just to maintain her health:

“Living with CF takes a lot of time, planning and discipline. My daily treatment routine is gruelling. Every morning I take three different nebulized medications to help open up my airways, thin secretions and clear mucus more easily, and minimize lung bacteria. This is then followed by lung physiotherapy. Using a hand-held percussor, I clap my chest in an effort to literally pound the mucus out of my airways so it can be cleared. In total this takes about two hours.

My blood sugar must be tested, and an insulin shot administered before eating each meal. Along with breakfast I take a handful of pills:

• enzymes to digest my food;
• vitamins to replace nutrients my body doesn’t absorb;
• pills to combat liver problems;
• pills for chronic acid reflux (common for people with CF);
• a pill to try to stem bleeding in my lungs; and
• one or more oral antibiotics.

Finally, I use my puffers – one to keep the airways open, the other an anti-inflammatory. Then I’m ready to start my day.

Throughout the day there is more blood sugar testing and insulin. Before bed I do two more inhalations, followed by more physiotherapy, and more puffers. All in all, I spend about four hours every day just trying to maintain my health. When you add time for exercising, a vital component in treatment, you have yourself a full-time job.”

The rigorous daily treatment regime outlined by Shannon is an essential component of health maintenance. Cystic fibrosis is a progressive disease, so early treatment may prevent damage to lung tissue resulting from infection and inflammation.

Improved disease management from day one can lead to a better prognosis later in life.

Approximately 60 per cent of Canadians with cystic fibrosis are diagnosed in the first year of life, and 90 per cent are diagnosed by the age of 10. This is in part a result of newborn screening programs in some provinces (including Ontario), and increased awareness and education about the disease.

Today, the faces of cystic fibrosis are changing. Because of advances in research and care, cystic fibrosis is no longer just a children’s disease. Although most people are diagnosed at an early age, there are cases where individuals reach late adulthood without knowing they have CF. Claire Boulerice, a woman from Quebec, had health issues her whole life. These problems were finally explained when a medical professional recommended she be tested for CF:

“At 58 years of age, I received an unthinkable diagnosis of cystic fibrosis. Although I had many of the symptoms including frequent lung infections and digestive problems, I was not diagnosed. I had seen a lot of skilled lung specialists and other specialists whom I trusted, but no one related my health issues to cystic fibrosis.

My diagnosis came when I participated in a pulmonary Shannon (right) and Wendie Price at Wendie’s wedding.
rehabilitation program at the Montreal Chest Institute. This is a multidisciplinary physical education and fitness program for people with chronic obstructive pulmonary disease (COPD). At the time, I had insisted my pneumologist (who was affiliated with another hospital) give me a referral; he didn’t think I had the requisite profile.

I’ll say it loudly, clearly and without hesitation: I owe my life to this program. I am especially grateful to Anne, the team’s physiotherapist, who supervised the physical re-education activities. When she saw my responses to exercise, and asked me about my family background, she suggested I undergo a sweat test and she made the arrangements for me. That is how I was diagnosed.”

Many people, like Claire, are caught somewhat off-guard when they find out that they, or a family member, have cystic fibrosis. Approximately 1 in every 25 Canadians carries a defective version of the gene which causes CF. When two people who carry a mutation of this gene have a child, there is a 25 per cent chance the child will have cystic fibrosis and a 50 per cent chance the child will be a carrier. Carriers do not have cystic fibrosis, nor do they exhibit any of the symptoms of the disease. As a result, many people are unaware they are carriers.

Robert Eberschlag, a father of three children with cystic fibrosis, is a perfect example; he and his wife were not aware that they were CF carriers until they started a family.

“It’s not always obvious which families are living with CF. Looking at my children, you probably wouldn’t realize there was anything different about them. Someone once told me that a child with CF is like a light bulb with a damaged filament – on the outside, they look normal – but inside, something is very wrong.

When my oldest child Sophia was born, we didn’t know she had cystic fibrosis. My wife Kerri and I had no history of CF in our families, and there was little indication that our newborn daughter was anything but healthy. Sophia was hospitalized overnight once as a baby, but the doctors diagnosed her with pneumonia. It cleared up quickly, and we thought it was an isolated incident.

It wasn’t until two years later, after our second daughter Juliana was born, that we found out she had CF. At six weeks old, Juliana developed a persistent cough. We immediately took her to our family doctor, who prescribed antibiotics to treat it.

By coincidence, or pure luck, Kerri took Juliana along with her to a board meeting at Juliana’s daycare. One of the attendees, who was a doctor, recommended that we take Juliana to the CF and Asthma Clinic at Sick Kids Hospital.

At the hospital they took X-rays and performed tests, eventually diagnosing Juliana with cystic fibrosis. When CF is diagnosed, siblings are routinely tested – and it turned out that Sophia also had cystic fibrosis.”

When cystic fibrosis is diagnosed, the person is referred to a CF clinic, which offers specialized multidisciplinary medical care. Clinic teams include a clinic director (physician), nurse coordinator, respiratory therapist, physiotherapist, dietitian, and a social worker. Some CF clinic teams also have a pulmonary function technologist, pharmacist, and a psychologist and/or psychiatrist.”

There are 42 cystic fibrosis clinics in Canada, treating approximately 3,800 children, adolescents, and adults. These clinics are partially funded by Cystic Fibrosis Canada and participate in Clinic Accreditation Site Visits, which support consistent care across the country.

Cystic Fibrosis Canada is the leading funder of cystic fibrosis research in Canada, and one of the world’s largest non-governmental granting agencies in the field.

The organization helps Canadians with cystic fibrosis primarily
by funding research and care. Cystic Fibrosis Canada annually
funds approximately 50 research projects, awarding more
than $6 million in grants to CF researchers and approximately
$2 million in grants to the 42 CF clinics, and five transplant
centres across the country.

Cystic Fibrosis Canada is a global leader in CF research
and care. In 1989, Canadian researchers, funded by Cystic
Fibrosis Canada, discovered the gene responsible for cystic
fibrosis. When the organization was established in 1960, most
children with cystic fibrosis did not live long enough to attend
kindergarten; today half of all Canadians with CF are expected
to live into their 40s, and beyond.

Although a great deal of progress has been made in the fight
against cystic fibrosis, much work remains to be done. Cystic
Fibrosis Canada is committed to finding a cure, and to helping
people and families affected by CF cope with their daily

fight. With continued and new support from Canadians, the
organization will enable the necessary research and quality
care for people with cystic fibrosis.

Learn more about cystic fibrosis from the people who know it
best visit www.drowningontheinside.ca

www.cysticfibrosis.ca

Correction Notice

With regards to article entitled "Current Approaches to Setting Optimal PEEP" found in
the Winter 2011 edition of RTSO Airwaves, please note the following correction:

The paragraph reading as follows:

"Lung strain is the transpulmonary pressure, more specifically the change in
transpulmonary pressure (∆Ptp) from end-
exhalation to end-inspiration. Lung Stress
is the ∆Ptp/Specific Lung Elastance (13.5
cmH2O)."

Should have read:

"Lung stress is the transpulmonary pressure, more specifically the change in
transpulmonary pressure (∆Ptp) from end-
exhalation to end-inspiration. Lung stress
is the ∆Ptp/Specific Lung Elastance (13.5
cmH2O)."

We apologize for any inconvenience in this matter.
BACKGROUND

- In 2000, the Premier’s Advisory Board (PAB) was created with a challenge to increase and improve organ donation in the province of Ontario
- 16 key recommendations including one central agency responsible for organ and tissue donation, routine referral and hospital coordinators
- Trillium Gift of Life Network (TGLN) was created in December 2000 by the Ontario government in response to the PAB recommendations
- TGLN was challenged to significantly increase donation across Ontario and improve related processes and functions
- TGLN’s mandate is legislated by the Trillium Gift of Life Network Act
- The TGLN Act was previously called “Uniform Human Tissue Gift Act”; similar legislation in every province governing organ and tissue donation

TGLN MISSION

Saving and enhancing more lives through the gift of organ and tissue donation in Ontario.

TGLN MANDATE

TGLN has a mandate to:
- Plan, promote, coordinate and support activities relating to the donation of tissue for transplant and activities related to education or research in connection with the donation of tissue.
- Coordinate and support the work of designated facilities in connection with the donation and transplant of tissue.
- Manage the procurement, distribution and delivery of tissue.
- Establish and manage waiting lists for the transplant of tissue and to establish and manage a system to fairly allocate tissue that is available.
- Make reasonable efforts to ensure that patients and their substitutes have appropriate information and opportunities to consider whether to consent to the donation of tissue and to facilitate the provision of that information.
- Provide education to the public and to the health-care community about matters relating to the donation and use of tissue and to facilitate the provision of such education by others.
- Collect, analyze and publish information relating to the donation and use of tissue.
- Advise the Minister on matters relating to the donation of tissue.
- To do such other things as the Ministry may direct.

REFERRAL TO TRILLIUM GIFT OF LIFE NETWORK

- All referrals to Trillium Gift of Life Network can be made to:
  - 1-866-363-TGLN (8456) or
  - 416-363-GIFT (4438) Toronto Local

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The idea of a **Tracheostomy Team** to improve the care provided to our patients living with a tracheostomy has been in discussion for a number of years. On November 23rd, 2010 the idea was finally realized! It could not come at a better time given the number of patients in the centre with a tracheostomy.

Over the last ten years, there has been an increased use of tracheostomy tubes in order to decrease mechanical ventilation time, pneumonia, intensive care unit (ICU) length of stay, and hospital mortality. With the advent of percutaneous tracheotomy in the Adult ICU, the ability to deliver on early tracheostomy has been facilitated. Resultantly, the number of tracheotomized patients in the ICU and subsequently on the general patient units has increased considerably. When these patients are discharged from the ICU the burden is transferred onto clinicians that do not have the same level of expertise. In addition to the increased number of patients in the ICU and on the wards, more patients are being discharged home with a tracheostomy. This requires care and discharge co-ordination to help prevent readmission.

At SJHC, at any given time, there are between three and 10 patients on our medical and surgical inpatient units, and another three to five in the ICU. We know as Respiratory Therapists caring for these medically complex, and sometimes fragile patients, the length of stay and/or length of time with a tracheostomy can be prolonged unnecessarily due to a variety of reasons. Many complications can arise with these patients. The more expeditiously we work to wean patients from a tracheostomy their ability to regain verbal communication, and return to natural oral intake of food, the better quality of life they will have. For those that cannot be liberated and will require discharge home with a tracheostomy, the team helps ensure timely patient and caregiver tracheostomy care education and works closely with hospital staff, the social worker and CCAC (Community Care Access Centre) hospital co-ordinator, to better customize a community care plan to ensure appropriate community supports and resources are organized prior to going home.

**Our Vision**

We are an interprofessional team dedicated to improving the comfort, confidence, and knowledge of patients living with a tracheostomy, their caregivers and staff.
Together the Tracheostomy Team members have been building on SJHC’s commitment to “Put Patients First” by providing the safest care by minimizing time with a tracheostomy tube through expeditious weaning, improving communication, facilitating eating, and assisting with discharge planning coordination of patients with tracheostomies.

**Key Team Successes since the Team’s Launch:**
- The team has assessed and facilitated a tracheostomy plan of care for 16 patients.
- Nine patients have been decannulated successfully.
- One patient has been liberated from the tracheostomy within 2 days of team involvement.
- Resolution of a medical problem that had delayed the decision to remove the tracheostomy was expedited.
- Two patients that would not be a candidate for decannulation were identified immediately post-tracheotomy. This resulted in timely discharge planning processes including tracheostomy care teaching for patient and care-givers and equipment organization for home.
- There has been immediate consideration for and performance of swallowing assessments when appropriate to identify opportunities for re-introduction of food.
- Two individuals not appropriate for corking were identified as good candidates for a Speaking Valve which enhanced verbal communication.

**Who is the Tracheostomy Team?**

The core team includes a Registered Respiratory Therapist (RRT), Speech Language Pathologist (SLP), and Intensivist. Unique to this team when compared to other Tracheostomy Team models is that the most responsible physician (MRP) hands over care of the tracheostomy to the Intensivist who also helps facilitate dialogue with specialty services where required. Four Respiratory Therapists directly support the team on its scheduled Tuesday rounds, rearranging their schedule in order to ensure coverage. The plan of care set by the team is then carried out by the front-line SLPs where the patients reside and by the ward designated RRT. In those circumstances when the plan of care needs alteration in between team meeting dates the front-line RRT and SLP are able to obtain new orders in a timely manner from the Intensivist so that care related to the tracheostomy is not delayed.

“I think that the care for these patients has not been as coordinated as it should be and those looking after them directly have been doing it in isolation. Now, with the team we come together, discuss each patients’ (needs) and develop a care plan (with everyone involved) – which is so important in supporting continuity of care for our patients,” said Dr. Joanne Meyer, physician lead for the team.

Though the Tracheostomy Team is still gaining momentum, we have already made a positive impact for our patients living with a tracheostomy and clinicians who work with these patients. The next steps for the team include reviewing the results of a pre-implementation staff survey; auditing charts of previous tracheostomy patients to establish a baseline against which current care can be measured, and developing practice guidelines that will further enhance care that the team provides to our patients living with a tracheostomy. Without the assistance of our dedicated clinicians this team could not be successful.

**Ginny Martins RRT, BHA(c).**
Charge Respiratory Therapist &
Tracheostomy Team Co-Lead
Respiratory Therapy Services
St. Joseph’s Health Centre, Toronto
The Cornwall Community Hospital (CCH) was incorporated in 2004 and is located in the city of Cornwall along the banks of the St. Lawrence River in Eastern Ontario verging on the US border. The historic city of Cornwall takes great pride in being able to combine small town warmth and hospitality with big-city facilities and services that allow Cornwall and its surrounding communities to offer a great quality of life. The availability of affordable housing, good schools, high quality healthcare and easy access to recreation (skiing, boating, hiking, mountain biking and golf) as well as it’s close proximity to Ottawa and Montreal for shopping, live theatre, concerts and sporting events, makes Cornwall a special place to live.

CCH is a 170-bed acute care hospital presently operating on two sites that were formerly known as the Cornwall General Hospital and the Hotel Dieu Hospital. CCH serves acute, in-patient, out-patient and community clients as well as providing a variety of cardio-respiratory services to the Cornwall population and the surrounding area. The McConnell Avenue campus is presently being renovated to accommodate the amalgamation of the two hospitals and will include a new Emergency Department, Diagnostic Imaging Department and OR suites. Many upgrades during its active redevelopment have already occurred in various areas of the hospital with more to come in the months ahead.

The CCH Respiratory Therapy department consists of 8 Registered Respiratory Therapists. Led by Nicole Leger as the charge RRT, the staff members include JoAnn Belmore, Marie Radley, Steve Smith, Amanda Lajoie, Katie Lalonde, Andrea Ladouceur and me, Tracy Bradley.

The RRT’s role at CCH is vast and encompasses many aspects of the RT scope of practice. Working in an active community hospital has provided opportunities to expand our role to its fullest capacity for a diverse patient population. Our duties include intubation and airway management, arterial line insertions, administration of neuromuscular blocking agents during transfer if required, IV insertions, performing cardiac stress tests, nuclear stress tests, Persantine tests, pulmonary function studies, Methacholine tests, administering Surfactant, performing ECGs and ABGs, spirometry, home O2 assessments, mechanical ventilation (invasive and non-invasive) for Tracey Bradley with Katie Lalonde and Nicole Leger.
all age groups, tracheostomy care, incentive spirometry set-ups and smoking cessations consults. The RRTs rotate from in-patient care to out-patient services to maintain competencies in all areas.

The RRT utilizes self-directed learning packages to complete certifications on intubation, arterial lines, intravenous insertion, and administration of neuromuscular blocking agents as well as Persantine, Aminophylline and Surfactant delivery. These packages consist of information to review and questions that must be completed. These are to be done every 1-2 years according to pre-determined requirements. The RRTs at CCH use a wide variety of skills which makes completing these self-directed learning packages imperative.

Coverage for Respiratory Therapy is from 0700 to 2400 followed by a rotational on-call service by the RT staff for emergencies. The RRT must be in the building ready to work within 20 minutes of a call in. The RRT may be called in to set up BiPAP, initiate mechanical ventilation or aid a newborn in distress requiring SiPAP or ventilation. Traumas, procedural sedation or cardioversions in the ER or ICU and transfers of critical patient to another facility also require RRT attendance.

The in-patient services include neonatal, paediatric and adult ventilation with the PB 840. When a patient is ventilated, it is by means of a protocol with allowance for the RRT to manage parameters to provide patient comfort and correct ABG’s. Utilizing the PB 840 ventilator for all patient populations has allowed out staff the comfort and expertise to be able to ventilate a neonate with the same proficiency that we have when in use on adults. When a neonate or paediatric patient is ventilated or on SiPAP at CCH, the patient is subsequently transferred to a tertiary care centre after stabilization at ours. The RRT is also responsible to administer Surfactant when needed.

The RRT is usually the first person called to a patient in distress and may be the first or most responsible healthcare provider to communicate with the physician to receive orders. Currently there are medical directives awaiting approval for ABGs, incentive spirometry, bedside spirometry, Ventolin administration and ECGs to allow the RRTs an opportunity to begin investigations or treatment until physician contact or arrival occurs.

A recent proactive project at CCH was to reduce the nebulized bronchodilator use in ER. Statistics showed that 5000 nebules were used in 3 months and since the implementation of a Ventolin MDI medical directive in ER, along with RN education on administration of MDIs with a spacer device, that number has reduced the same 3-month period use in the following year, to about 100 nebules.

Another area requiring RT expertise at CCH is the Respiratory and Heart Failure Rehabilitation Program, which is open Monday through Friday with a full time RRT on staff. The goal of the program is to improve the quality of the patient’s life so that they are able to function more independently. The patient must attend a 12-week program that requires twice weekly 1-hour exercise sessions. The program encompasses health education, promotion, screening and self-management. This program also provides early access to point of entry and enhances patient care through early recognition and treatment. A reduction in Emergency visits and hospitalization has resulted. Strong partnerships between specialists, family physicians and the multi-disciplinary team are the program's backbone.

We look forward to working in a newly constructed hospital and for the future changes and growth that will allow the Respiratory Therapists at CCH the opportunity to continue to provide high quality care to our patients and their families.

Submitted by: Tracy Bradley RRT

Marie Radley

Submitted by: Tracy Bradley RRT
**The Timmins and District Hospital** is a 159 bed level ‘C’ hospital that would probably be considered by most as small and isolated, but we are an important referral center to the more rural hospitals in our Northeast LHIN (#13). The hospital provides a full service Emergency Department with 24 hour physician coverage, a 7 bed critical care unit, specialty medical, paediatrics, surgical, modified level 2 nursery, chronic/rehab care and advanced diagnostics. The city of Timmins is situated approximately 700 kilometers northeast of Toronto. For those wondering, this translates to a 7 ½ hour drive, primarily on a two lane highway!

Respiratory Therapy services were once provided at the old St Mary’s General Hospital site by a sole RRT but we have since grown to a staff of 17 RRT’s at our current TDH site. The late Gary Tang, a former clinical instructor for Fanshawe College, was one of the original pioneer RRT’s at the old St Mary’s site who had a vision for the RT department that we have today.

Respiratory Therapists at TDH provide cardio/respiratory services to all in-pat areas as well as out-patient diagnostics including PFT’s, Cardiac Stress testing, ECG’s and Holter/Loop monitoring. In order to maximize flexibility with scheduling, most of our RRT’s are cross trained and rotate through several of these areas. TDH is also home to a busy 5-bed sleep laboratory where daytime and nighttime testing is performed. Asthmatics within our catchment area are followed by Vanessa Lamarche RRT and Certified Asthma Educator where out-patient respiratory assessments, spirometry and education occur in our Paediatric Asthma Clinic. Prior to 2008, overnight coverage was on-call only, but an increase in demand led to 24-hour coverage for our in-patient clinical areas.

Our hospital has always supported RRT’s in alternative roles and currently this includes Jodie Russell as our Infection Control/Risk Management Coordinator, Jennifer Plant as our Organizational Quality and Patient Safety Leader and Susan Boisvert as our Organizational Professional Practice Leader and Cardiopulmonary Team Leader. The other members of the team include Larry Lovelace, Elaine Tremblay Labelle, Allison Kean, Sylvie Dumas, Andrea Richard, Kim Dicks, Tiffany Fink, Andrew Pigeon, Melissa Rothel, Natalie Collings, Tanya Cloutier, Jo-Anne Parent Gagné and Monique Ouellette.

In addition, our RT department provides a clinical site for the Canadore College Respiratory Therapy program. Medical students from the Northern Ontario School of Medicine, nursing students from Laurentian University (Northern College site), critical care paramedics and high school co-operative students also spend time shadowing an RT.

We provide care to a wide range of patients. This allows us to maintain and explore a diverse scope of practice. A day in the life of a TDH RRT covering in-patients would probably start with a few routine ECG’s, providing airway management during an ECT procedure, assessing patients on the in-patient wards and assessing ventilated patients in the ICU. Then your phone rings and suddenly, you are asked to juggle a call from ER for a VSA on the way and a sick baby in the nursery or any other of a multitude of directions.

Working in an isolated community hospital requires our RT group to be multi-skilled, innovative and always ready for the unexpected!

Interprofessional collaboration takes on a new meaning when you know the whole healthcare team by their first name. Whether through acute care, cardiac/sleep/pulmonary diagnostics, coordinating patient quality initiatives, or guiding infection control practice, RRT’s at TDH are valued members of the healthcare team. Timmins, ‘The City with a Heart of Gold’, is a great place to live and raise a family and one of the best parts of working at TDH is that it has allowed us to come back home to the North.

Submitted by Vanessa Lamarche RRT CAE
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RTWB Pandemic

Pandemic (Greek πᾶν pan "all" + δῆμος demos "people") an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population (Miriam-Webster)

Within the last century, health care has changed dramatically due to the technological revolution. "Inhalation Therapists" identified a need for safe oxygen use, intermittent positive pressure breathing, CPR and negative pressure ventilator management. They began diligently filling this need and developed as Registered Respiratory Therapists (RRTs) with a more clinical focus. With less than four decades since inception, this generation of active well-respected Ontario RRTs stands 2679 strong. Our expertise is well sought after in the intensive care, critical care, complex continuing care, cardiopulmonary diagnostics, community care and education areas to name a few.

The Canadian Lung Association motto summarizes the need for RRTs best. "When you can't breathe, nothing else matters." RRTs are an integral foundation to the healthcare system. Through your hard work in building rapport with other health care practitioners (HCPs) and patients we are highly respected HCPs. How many times have you heard, "What a relief, the RT is here!" As healthcare systems develop and technology progresses, our role will only expand as clinically focused, yet technically competent people.

We really have the best of all worlds. Birthed from the convergence of technology and healthcare, we are by nature professionals that seek/serve a niche but integral area of health care. With much of our time at the bedside, our work is patient focused and very clinical. And with exposure to all areas of the hospital/community we have an extremely diverse/resourceful network of experiences and other professionals from which to obtain ideas/feedback. To survive as RRTs, we are by nature always on our toes and thinking creatively.

“...we have an ethical and moral obligation to reduce extreme poverty and to improve the health of the world's least healthy."1 This seems a fair statement given the medical research/technology available in Canada. If not driven by the principle of beneficence, with world travel it is obvious that epidemics have no borders as seen with SARS, H1N1, etc. But how can we make a difference with obligations to our families and in our communities here?

Respiratory Therapists Without Borders (RTWB) is a pandemic that can empower RRTs to perform at their full potential. Lessons we learn from our daily practise are actually sought after by people worldwide! We hope to network you with other professionals to exchange ideas so that together, we can ensure the best respiratory care for each person on the planet. After all, everyone deserves to breathe.

The RTSO fully supports the RTWB movement and that Ontario RRTs can make a significant contribution to the respiratory health of all of the world's citizens. The RTSO would like to propose a challenge to our membership to consider how you can contribute to the RTWB movement. Whether, it be through donation of equipment and resources or volunteering for the RTWB's executive committee and board work or signing up for missionary work serving others in need with expert and compassionate care in the way only we as RRTs can!- contact the RTWB at www.RTWB.ca

RTWB pandemic. Be a part of it now, or be a part of it when it gets you!

Check it out @ www.RTWB.ca

Jason Nickerson is a Respiratory Therapist and PhD candidate in Population Health at the University of Ottawa. He works as an Anaesthesia Assistant at The Ottawa Hospital and is a Fellow of the Canadian Society of Respiratory Therapists. He serves on a number of committees, including the Editorial Board of the Canadian Journal of Respiratory Therapy and the Surgical Issues Within Humanitarian Space working group at the Harvard Humanitarian Initiative.

“Much like many of you reading this, my professional life has undergone several iterations, reinventing itself every few years, leading me to places that are often yet-unknown. Curiosity has driven me to the places I have been, and I have sought to build my career around those issues for which I have a passion. I am currently a PhD candidate in Population Health at the Centre for Global Health at the University of Ottawa, an opportunity that I view as a culmination of my achievements and interests and as a starting point for further exploration of the issues for which I am truly passionate.

I attended Dalhousie University, earning a Bachelor of Health Sciences in Respiratory Therapy, which undoubtedly set the stage for my future pursuits. I earned my master’s degree at the University of British Columbia and while completing my thesis (focusing on interprofessional care in HIV/AIDS), I worked on a number of projects related to neglected tropical diseases and access to essential medicines.

My work at the University of Ottawa focuses on health in a global context. My research examines the ways in which health services are arranged and delivered in low- and middle-income countries, and I work in health services provided during disasters and humanitarian crises. I focus on three fairly specific areas within this world: (1) How we can better assess acutely disrupted health systems to understand their ability to meet the needs of crisis-affected populations and how decisions regarding humanitarian health aid can be better organized; (2) The provision of surgical care in low- and middle-income countries and the population burden of surgical diseases; and (3) Barriers to access of essential medicines, most specifically pain medications.

I consider myself to be extremely privileged for the opportunity to explore issues of importance to me, and the world. While my current work strays slightly from the standard realm of practice for most Respiratory Therapists, the profession remains the foundation upon which the rest of my work has been built. The profession has provided me with immense opportunities for personal and professional growth, and has helped to develop my identity within the global health world.

The most important influences in my personal and professional life have been strong mentors both inside and outside of Respiratory Therapy. As a student, I was privileged to have strong mentors who understood the value of professional development and the provision of high-quality evidence based care. Upon entering into practice, I was integrated into a department with a strong role for Respiratory Therapists that sought out new challenges and solutions, driven by a keen sense of curiosity and respect for our patients and colleagues. By sowing the seeds of professionalism and professional growth early in my career, my colleagues encouraged my curiosity (and nurtured my inner geekiness), empowering me to explore my options further.

My professional life closely mirrors my personal life, in that I am continually seeking to build on the experiences and the knowledge that I gain over time. While I draw distinct borders around what is my personal and professional life, both are influenced by one another. As a clinician, I am given the privilege of speaking with and learning from patients who are often undergoing significant challenges in their lives; in my personal life, I have made a conscious effort to ensure I have diverse interests that allow me to explore and challenge my understanding of the world. Both my personal and professional experiences act synergistically and have helped me develop as a clinician and as someone exploring the world.

My work as a respiratory therapist has played a key role in helping me to understand the complexities of clinical health services – I am truly grateful for all of the opportunities that have presented themselves and I look forward to continuing to serve the profession for years to come. My experiences are but one example of the many interesting opportunities that are available to respiratory therapists willing to look for them.”
Student Corner

The third year of every Respiratory Therapy program in Ontario focuses on developing one’s knowledge, skills and mentality to be clinically qualified to perform the role of a Respiratory Therapist. To be successful, we must embark on many challenging situations and scenarios as well as experience a glimpse into the life of shift work.

As I approach the end of my clinical year, there are many things I will reflect back on. This is very important, as the only way to continually dedicate ourselves to lifelong learning is to embrace a commitment to reflect on what we’ve learned. Aside from the clinical skills and knowledge that we have acquired as Student Respiratory Therapists, we have learned to work as part of a collaborative, interprofessional team; to be there for a patient’s happiest moments and darkest hours. Such a wide spectrum of care can make us realize that we have to understand how to adapt quickly in an environment that is engrossed in managing patient care plans. Yet, as we have been so focused to ensure our competence to ourselves and those around us, we must question if we ensured that we are internally prepared for the career that lies ahead?

I am certain that all of us, at least once this year, have experienced a situation that was very tough on us mentally and emotionally. Regardless of the situation, we still had to learn to focus on the task at hand. This takes a particular skill and to do so can be challenging but it is one that I think anyone who is involved in health care must possess. However, following that critical situation or catastrophic event, what did you do? Did you talk to a good friend or someone who was in health care who could relate with your experience? Did you go for a walk outside or work out at the gym? It is important to realize that as we develop our clinical minds we must also develop our ability to cope with the variety of emotional and ethical situations we will find ourselves in. It is important to find a way to relax your mind, body and soul so that you don’t internalize every difficult clinical incident that you experience.

Clinical scenarios such as one-way extubations, crying family members as they say goodbye to a loved one or a patient receiving a very difficult diagnosis must all be put into some type of perspective or offered some sort of rationalization. Conversely, we are also present when a patient is extubated or decannulated, a newborn responds to the skills that you have provided in resuscitation and is held by its parents for the first time or when a patient smiles at you and simply says ‘thank you.’ We get to be there for an array of scenarios with a variety of patient experiences.

The learning curve ahead will be extensive; physically, mentally and emotionally. However, let us remember that while we may not agree fully with everything we are about to see or have involvement with, it is about doing the best work we can do to the best of our ability. It’s also about our continual growth personally and professionally. In the end, it is understanding the next ride that we are about to embark on, the road that it may follow and the profession that we have so diligently worked to succeed in and earned a right to be a part of- Respiratory Therapy.

Brittany Giacomino SRT
3rd-year Respiratory Therapy
Michener Institute
Toronto, ON
Cough, cough. Wheeze, wheeze. I wake up again in the middle of the night, drenched with sweat, short of breath and wondering what is wrong with me. I think to myself, when will I start to feel better? After a few trips to the doctor, and several rounds of antibiotics later for “pneumonia”, I realize there is something more than just “pneumonia” going on. Sure I’d start to feel a little better with the antibiotics, but they never seemed to fully take away the symptoms. Finally one day, I’d had enough. I went back to the ER more short of breath, with an annoying cough, feverish, down in weight and hypoxic. I wanted answers! I wanted to know what was making me feel so crumby! I wanted to start feeling better!

As an Respiratory Therapist with 10 years of experience, I’ve treated my share of patients with tuberculosis. I knew the signs and the symptoms, but I never in a million years thought I would be one to fall ill with it.

Suspicious chest x-rays led to a CT scan where it showed the classic signs of TB … the stippled, patchy infiltrates bilaterally, and reticulonodular patterns. They said it was an atypical pneumonia, possibly TB, but unlikely, and I would have to be admitted for treatment and maybe a bronchoscopy. And so there started my isolation experience. After a few days of aggressive antibiotics, oxygen and puffer therapies, there was not much improvement so the decision was made to do a bronchoscopy.

A bronchoscopy! We do that on our patients! As RT’s, we often try different things on ourselves, but we never do bronchs on ourselves! It was uncomfortable and I ended up in ICU afterwards with an exacerbation of my already severe asthma and further hypoxia. I stayed there for about a week on BiPAP, heliox and the like, before I was stable enough to be transferred back to my fishbowl of an isolation room. A few days later, the sputum smear results were back from my bronch. They were negative for TB, but despite this, they would not remove my precautions, unsure as to why I was not getting better. I was still isolated from the world around me.

Finally the infectious disease team came and removed the precautions. I was at last free to walk the halls. Unfortunately, this was short lived.

I thought it was a joke (mind you not a very funny one) when the respiriologist came into my room wearing all the PPE again! She said “the culture from the bronch came back positive. You have active TB”. It was a shock to not only me, but to everyone involved in my care, including my family and friends. After all, the doctors all said that it was very unlikely to be TB. Back went the airborne precautions.

On the heels of the respiriologist, an ID doctor and a nurse from Public Health followed. It was then that the interrogations started … have you ever been in jail or prison? Have you ever lived on the streets? Or in the slums? Have you travelled to the TB populated areas? Are you aware of any known contact? I know they were just doing their jobs, and she was a very nice nurse, but it was pretty demoralizing!

And so the 5 drug cocktail started. All I’ll say about this is that they were not fun at all! Five drugs turned into a handful as we tried to counteract the reactions each were causing.

After a little more than a month in hospital, I was finally free to go home to be with my husband and dog. But “free” is a loose term here. I had to be home at a certain time every day so that a Public Health worker could come and watch me take the TB meds. Again … very demoralizing!

Nine months later, I am done the TB treatments, but after a year of being off work, I remain off. It is not known whether I will ever get back to doing the job I love to do. The TB has affected my lung function greatly, interfering with everything I took for granted before. I rely on a BiPAP at night to assist my breathing while I sleep so that I have enough energy to function during the day. Sure, the asthma was bad and I had some limitations before all this started, but I was better able to manage and control it then, than I am now.

As members of the RTSO, we all received the e-mail March 24th stating that it was World TB Awareness Day. I am writing this to re-enforce the point in that e-mail that TB is not a thing of the past! It is very much still around us and we, as RT’s who are exposed to who knows what during any given shift, need to make sure we take the precautions to protect ourselves while helping our patients. Don’t take it for granted that you have good health now, because it can take a very sharp and rapid turn for the worse with just one breath!

So take the time to don all the appropriate PPE. If in doubt, put it on anyways! How many times have we seen a patient one day under no isolation, only to go back the next day to find them in complete isolation? Protect yourself! TB is not fun!

Jodi Rushton RRT
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The future role of the RT, role progression, role evolution, these have all been ongoing questions for as long as I’ve practiced as an RT. I think this stems, in part, from the fact that we are still a relatively young, evolving profession.

In the beginning, our role was driven primarily by technological change. At the time, the other primary caregivers of the era were nursing staff who lacked the time and, in some cases, the inclination to contend with the ancillary respiratory equipment as it was developed and introduced to the health care setting.

Essentially, the “techs” who handled the oxygen equipment were either handed the responsibility for, or voluntarily took on, the operation and use of these devices. As the complexity of the equipment increased and the clinical conditions for its application became more challenging, the requirement for more specialized training and skill sets outside of traditional medical and nursing roles (though encompassing elements of both) developed.

These informal classes or “in house” courses evolved over time into more formal educational programs which have since developed into the schools respiratory therapy we have today. The formalized education process combined with the establishment of a national registry exam helped “legitimize” the profession and established the basis for the early changes from a relatively young, evolving profession.

As intensive care units were established and therapies developed, the complexity and clinical involvement of the RT in these areas also expanded. The initial “foot in the door” was the ability to set up the oxygen delivery equipment and operate and maintain the complex mechanical ventilators required. This technical expertise provided insight into how the machine and the patient interacted. This in turn led to a greater role in the bedside operation and management of these devices as the ability of the RT to provide this care was recognized.

Over time, the direct clinical care and patient assessment role was brought to the fore with less stress on the strictly “technical” aspects. The content and format of the educational process changed to meet these demands. A role reflecting practice as a patient care provider as opposed to a technician was established. This was further formalized with the proclamation of the RHPA and the establishment of the College of Respiratory Therapy, in short, a legal recognition of our profession as a distinct group of health care providers.

In a period of some forty years, we have evolved from unaccredited, informally trained technicians to skilled, licensed healthcare professionals and have, in the process, gone through a number of title changes reflecting these developments. That is the past, what of the future?

I believe the existing acute care role will continue with critical care remaining the core. Some changes here may include greater RT participation in multidisciplinary rounds and patient care conferencing. This will provide more opportunities for input into direct patient care and the course of therapy.

RT involvement on multidisciplinary response teams will also be expanded as the acuity of the general wards population increases. This “acuity factor” will also drive the development of more directives for acute care to allow more autonomy for these teams and to streamline patient care. RTs will be among the members of the multidisciplinary teams developing these directives.

The need to move patients efficiently through the acute care system and back into the community may result in an expanded role into ongoing complex continuing care and rehabilitation. Again, this would encompass patient assessment and input into the development of appropriate care plans. This would require an enhanced RT role in direct communication with the patient, their family and other involved healthcare providers.

There will certainly be other changes brought to the healthcare system as an aging population places greater demands on healthcare resources. Some aspects of the RT role will change as the healthcare model moves away from a primarily physician led, acute hospital care based model to a more multidisciplinary, broader spectrum and preventative approach. A multidisciplinary community clinic would be an example of this type of care setting.

The ability to assess a patient’s respiratory needs combined with the understanding of the underlying pathophysiology puts us in a good position to work with and advise other prescribers. In the community clinic setting, the RT may in some cases, be the first line contact for respiratory patients. We can become more directly involved with patient education with regard to use of therapeutic adjuncts and assist in the development of individual patient care planning, coping strategies and techniques. With the advent of the “fifth act” we can also become more directly involved in the prescribing and titration of oxygen.

There will also be a greater role for RT lead research into the development and assessment of therapeutic modalities, devices...
Have Your Say (CONTINUED)

and diagnostic procedures. There is a potential role for RTs to become more involved in the decision making processes through involvement on committees and boards at the county health, LHIN and provincial levels. These means offer a way to increase the profile and influence of the profession.

With the establishment of our college and with growing member support of our provincial and national associations, the future and further development of our profession lies in our own hands more now than at any other time in the past. Through the application of our combined experience, wisdom and energy we can remain an effective and vital part of the healthcare delivery team well into the 21st century and beyond.

Grant Emon RRT
Quinte Health Care
Belleville, ON

Grant Emon and his wife
Danielle

Julie Brown, RRT, FCSRT replies:
What do I see as the future role for Respiratory Therapists in the healthcare team? Well, first of all, I think the most important thing is to go back to the basics and focus on some of our most important and rudimentary skills, things like ventilation and airway management; those are our “bread and butter”. We have training and skills unlike any other healthcare profession and sometimes those skills are not necessarily being used to their full potential. As RRT’s we need to ensure that we are the experts when it comes to the latest technology and to become the leaders in the healthcare team when it comes to applying new equipment, modes or techniques in treatment for patients. A large part of this comes with continuing education and being involved in research. As professionals, we always need to be growing alongside our profession and in order to do so; we need to attend conferences and lectures to learn and understand what is going on across the country and around the world. Whether you are the only RRT in a small setting or you exist as one of a large group in a large centre, there are still many things that can be learned from others.

I also feel that one of the areas where RRT’s can reach greater heights is in research. The more research projects that RRT’s participate in, the better it is for the entire profession. Each study conducted and published, no matter what the results, and even something as minor as a poster presented at a conference does wonders to build up the recognition of our profession. These research skills are now a basic part of most RT programs and hopefully this will allow the role of RRT’s in research to continue to develop even broader roles in the future. Through research, we can prove just how valuable our basic knowledge and skill level is by using it to assist with studies, and to develop and test new theories and equipment.

I do believe that the profession is growing in some amazing directions such, the AA and community care roles being two great examples. Continuing to develop and grow is also a great way to sustain the profession. I think there are many avenues that could be explored in the future for this profession which could open even more doors.

Above all, I feel like our profession is still one of the best kept secrets in healthcare. Not many people really know or understand all that we can do. I believe that, with this as a focus, our profession can continue to evolve and substantiate the great role that we have within the healthcare team. So, each of us needs to be the advocates for our profession and ensure that everyone knows just how talented and knowledgeable we are, and what a wonderful profession Respiratory Therapy truly is!

Julie Brown MSc.(c), RRT, FCSRT
Fanshawe College
London Health Science Centre
London, ON

Julie Brown and son Asher

Susan Ord RRT replies:
I have been a Respiratory Therapist for over 30 years and have witnessed and been a part of the evolution from Respiratory Technologist to Respiratory Therapist. As a profession, we have been in a constant state of change. With our expertise in airway management, invasive and non-invasive ventilation, management of cardio-pulmonary disease and conditions as well as our expanding scope of practice under the RHPA, we are poised to offer even more value to the healthcare team! Growth of the profession has to have buy-in from all members of the profession. When there is an opportunity to move forward, promote the profession or advertise our abilities, we need to let everyone know what we can do. Resources in healthcare, especially financial resources are limited. There are emerging professions that are competing for these dollars. Health information specialists, health educators (those with undergraduate degrees in health education), physician assistants, expanded practice nursing and paramedics are all professions vying for health care dollars in acute care settings as well as community and family-centered care.

Every discipline within health care has evolved. It is only in the past 15 years or so that we have seen a growth of nurse practitioners or intensive care medicine as a specialty.
discipline. As a profession, we should be looking at developing an expanded or extended class of RRTs. We already have RRTs in our profession that are specialized to neonatal care, anaesthesia and community care. We need to be aware of the strategic plans for health care development in Ontario and proactively respond to them. More resources are also going to be put into disease prevention – what can we do to support this strategy?

RRTs should further enhance their skills and level of education to be the best in their area of expertise. As well, we need to be visionary and continue to independently seek out and control our own perpetual evolution. With our capacity to accept change, our dedication to patient care and the ability we possess to do more, even under our current scope of practice, we should be moving forward as a profession that promotes and utilizes all of the resources that are authorized to it to perform. Doing so will only increase the awareness and value of Respiratory Therapists to healthcare delivery.

Susan Ord RRT
Patient Care Manager
Respiratory Therapy
Lakeridge Health
Oshawa, ON

Jeff Dionne BSc RRT titles his response:
The Ever Changing Face of Respiratory Therapy

The allure of Respiratory Therapy has always been one where the work day was constantly changing. One minute you would be attending a Code Blue event in the Emergency Department and the next moment you are assisting with the delivery of a 28 week gestation neonate up in Labour and Delivery. It is this ability to adapt to any clinical scenario that has allowed Respiratory Therapists to thrive in the evolving world of health care.

The multi-tasking abilities and outstanding prioritization skills of a Respiratory Therapist are those that have made this profession a hot commodity, not only in the acute care setting, but also in positions of leadership. The trend and vision we are seeing for Respiratory Therapy is that they are not only being asked to optimize their talents at the bedside, but also to lead hospital-wide initiatives. It is common today to see Respiratory Therapists working as Infection Control Practitioners leading important initiatives such as Ventilator Associated Pneumonia and Hand Hygiene. Respiratory Therapists are managing Interprofessional Teams within their organization and serve as Quality Improvement Advisors leading change throughout an organization. It is also not unheard of to have a Respiratory Therapist as Manager of the critical care area within a hospital.

Looking forward, as the electronic patient record continues to evolve, a major opportunity is to have Respiratory Therapists working as leads in the e-Health movement. Our technological expertise and troubleshooting abilities make a Respiratory Therapist the ideal candidate for this type of position. Our practical approach to health care allows us to offer a perspective to the electronic medical record that is one of applicability and ease of use.

The wide and expansive skill set that a Respiratory Therapist has to offer is only now being tapped into from a leadership perspective. It is my feeling that we are not far away from seeing a CEO of a major health care institution tell us of their beginnings in health care.....as a Respiratory Therapist!

Jeff Dionne BSc RRT
Clinical Co-ordinator
Respiratory Services
St. Joseph's Health Centre
Toronto, ON

Kyoom Abdool BSc. RRT replies:

With the advent of new allied health professions seeking provincial government regulation, many of these evolving healthcare fields are seeking opportunities much like those who practiced Respiratory Therapy not too long ago, when our profession was surfacing above the clinical horizon and rapidly progressing.

Unfortunately, Respiratory Therapy was expected to expand across the globe after its infancy in North America. This has still not happened and one must ask the question, why? Perhaps it is the capitalist approach to healthcare that exists in the United States and Canada only followed the American path due to our close proximity but other nations that provide medical care through a socialist approach have not seen the need. They believe that nurses can aptly provide the clinical care and biomedical personnel can take care of the technological issues and concerns.

However, I would like to believe that these nations have simply been ignorant to the need that clinical healthcare has for professionals like Respiratory Therapists who can utilize their expertise and understanding of technology and disease management and marry the two together for the betterment of patient care.

While I have faith that Respiratory Therapists still have a great number of opportunities within the realm of healthcare delivery, I also believe that we need to continue to focus on
Have Your Say (Continued)

our roots and remember from where we came. Those roots are what separated us from other existing fields. We possessed two spectrums of knowledge; a technical knowledgebase that allowed us to understand the rapidly emerging technologies and devices coming to market and the clinical skills and proficiency to apply those devices to patient care for positive outcomes.

We must be aware and accepting of the importance that our technological knowledge adds to our practice and how the strength of that knowledgebase impacts our practice. Otherwise, it will not separate us from any other profession. In fact, we could very well be another allied health practitioner with a respiratory specialty.

Technology is vital to the field of Respiratory Therapy. We must maintain that strength. Outside and inside of the hospital setting, our entire world is rapidly changing as a result of technology. If we continue to embrace those roots and utilize them within our practice, we will continue to add value to healthcare delivery because no other profession possesses this as an expertise. This will not only secure future advancements to our practice but it may also save our profession.

It is also vital that we become involved in the area of clinical research so that we can maintain our role as the “expert” in the field of Respiratory Therapy. Not only should we work in collaboration with others performing respiratory research projects, we must be engaged to take the lead role in this area to ensure that we control the future direction and evolution of our practice and subsequently our profession.

Kyoom Abdool BSc. RRT
Territory Manager
Trudell Medical Marketing Limited

Ask aRTee

Dear aRTee,
I have recently graduated from school and have been working as a full time respiratory therapist at a local hospital. I get frustrated easily because I feel like I have a lot of good ideas and have something to share, but I feel like as a junior member of the Respiratory Therapy team that my opinions are less valued because I have less experience. What can I do to get my opinions heard?

Thanks,
Needing a Voice

Dear Needing a Voice,
I know it can be very frustrating to feel like you are less valued on any kind of team, especially in the work place. Sometimes senior staff members can forget that a new graduate has a lot to offer. Not only are you full of wisdom from preparing for your Canadian board exam, I have found in my experience that the junior staff always have a great deal of enthusiasm and new ideas to bring to the table. As well, they always seem to be the first ones volunteer when different tasks and projects arise in the department. I remember feeling the same way when I was a junior staff member. As a manager of an RT department, I find one of the best ways to get the respect of your colleagues is to become a more active member of the team and get more involved in opportunities to grow your knowledge and experience. Everyone does things differently but by listening to what the senior staff has to say and the insight that they can provide, as well as adding your personal touch is a good way to stand out positively in the work place. Senior staff members have a lot of experience under their scrubs but junior staff members have gumption and new experiences to add to our practice. If everyone works together, then you will have a very good working experience, as well as a positive relationship and respect from your colleagues.

Thanks,
Homecare Unaware

Dear aRTee,
I have been a Respiratory Therapist for a long time now, working full time in the acute care setting. I must admit that I never really paid too close attention to the home care aspect of our job. Unfortunately, a close family friend was recently diagnosed with end-stage COPD and was put on home oxygen. This family friend came to me to ask advice, and I really didn’t have any information to offer as I am not that familiar with what kind of equipment is available or the full extent of homecare services of our local vendors. I was wondering if you had any experience with this or any advice you could give me so I am more in tune with other aspects of our career.

Thanks,
Homecare Unaware

Submit your questions to office@rtso.ca
some friends who work for various homecare companies. As far as equipment goes, all homecare companies use similar equipment but with variations in models.

In the Home:
The molecular sieve oxygen concentrator: is a reliable piece of equipment that is the most functional and easy to use for patients. It works by separating oxygen from nitrogen in the room air. It does this by drawing room air into one of two sieve canisters. The sieves contain sodium aluminum silicate pellets or “zelite pellets” that absorb nitrogen, carbon dioxide and water particles and separate them from the oxygen. The two sieves have an automatic pressure swing between them, back and forth, to separate the gases. The first sieve has a set pressure to produce oxygen and the other is de-pressurized to purge out the other gases and water vapour. Oxygen leaving the first sieve is stored in a small accumulator for patient use. One thing to note about the concentrator is that the higher a flow is set, the lower the FIO2 that is delivered. 

1-2LPM – 92%- 95%
3-5LPM -- 85% - 93%

Most concentrators go to 5LPM but there are high flow concentrators that can go to 8LPM and 10LPM. You also have the option to tee in two “low flow” concentrators together to maintain a higher flow rate. Just be sure to put both concentrators at the same flow rate because back pressure will affect the flow rate if they are not equal.

Example- 8 LPM → If you don’t have a high flow concentrator you could tee in two low flow concentrators at 4 LPM each to even out the pressure, instead of doing 5LPM and 3LPM.

Portability:
Cylinders:
Cylinders are a very common method for homecare patients to get around. The four most common homecare cylinder sizes are B, C, D and E. Because the oxygen concentrator works only when plugged in, the patients should have a back-up cylinder in case the hydro goes out and their oxygen concentrator stops functioning. This is usually size E. Depending on how high the flow is and what size the cylinder is determines how long it lasts. Because a patient usually ends up needing to take out multiple cylinders at one time if they are going out for the day, the Respiratory Therapist may suggest an OCD; Oxygen Conserving Device. The OCD attaches to the cylinder like a normal regulator, using the pin index safety system for oxygen. The difference is that instead of turning on the flow and giving the patient continuous flow, the OCD has a battery that allows a sensor to pick up patient inspiratory effort and gives a breath of oxygen making it a pulse dose instead. While the patient is breathing out, there is no flow, the higher the setting on the OCD the larger the amount of oxygen per breath. This gives the patient approximately a 3:1 ratio when comparing pulse flow to continuous flow with a normal regulator. If their cylinder was lasting 3 hours before, it will now last approximately 9 hours.

Portable Oxygen Concentrator:
For patients who are unable to master the cylinders or who prefer to have something different, there is another option. Patients can use a POC, which works identically to an Oxygen Concentrator but it is portable and it is a pulse dose system just like the OCD. Patients tend to really like this option because they no longer have to worry about replacing cylinders and changing regulators/OCDs. Instead, all the patient has to do is charge the battery before they go out. The battery life is dependent on the patient’s flow rate as well as the patient’s breath rate.

Liquid Oxygen:
Patients who require really high flow rates usually have two issues to contend with. The higher the flow rate, the less time a cylinder will last. Most of these patients can’t use an OCD or a POC because the pulse dose is not sufficient enough to maintain an appropriate SPO2 for the patient, which means that this would leave a patient with a cylinder and a normal regulator. For some patients with flows above 6LPM, a cylinder may only last 20-30 minutes depending on its size. For these patients, we recommend liquid oxygen because a very small amount of liquid oxygen will equate to a large amount of gas. Liquid is delivered to the patient in a large canister called a Dewar, where the liquid is held at relatively low pressures (<250psi). The Dewar has a double steel wall separated by a vacuum. The vacuum eliminates heat conduction and keeps oxygen below its critical temperature. (~181.1 F). The liquid flows up through vaporizing coils that are exposed to ambient temperatures which converts it to gas. The gas is delivered to the patient through a pressure reducing valve at normal working pressure of 50psi. Patients are given smaller liquid cylinders to fill from their home base unit (Dewar) when they leave the house. Patients have to remember that even if their oxygen liquid cylinder isn’t in use, the oxygen will eventually evaporate.

As far as homecare visits go, patients have regular homecare visits from an RRT/RN or another health care professional. The HCP works closely with the patient to help meet all the patient’s needs at home and for portability. I have only lightly touched base on some of the more basic things. The best learning tool is to talk to your oxygen provider and listen to what they have to offer. You will learn a lot.

References:
“My priority is to use technology that’s as non-invasive as possible and comfortable for my patients.”

“And I want to give my RT team a device that’s both effective and easy to use.”

“No trade-offs, no compromises.”

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RTSO AWARDS
FOR OUTSTANDING ACHIEVEMENT IN 2011

The Respiratory Therapy Society of Ontario (RTSO) takes great pleasure in offering three service awards for outstanding contributions to respiratory care by its Members. These awards highlight the dedication and achievement of the nominated members. Please note that when considering a peer for these awards, you are providing the profession a reflection on all that we can do. Please review the criteria and nomination forms on our website and make a consideration to nominate someone you know for one of these awards. All entries are due August 1st, 2011.

STUDENT ACHIEVEMENT AWARD
The Respiratory Therapy Society of Ontario (RTSO) Student Achievement Award is given each year to a graduating student, from an accredited Respiratory Therapy program within the Province of Ontario, who has demonstrated outstanding professionalism and performance during their clinical training.

THE PINNACLE AWARD
The Pinnacle Award is a premium award, given only to a member of the Respiratory Therapy Society of Ontario who has contributed to the profession in an exceptional or unique manner to the direct or indirect benefit of all members.

THE GORD HYLAND MEMORIAL LEADERSHIP AWARD
This award was established to recognize Gord Hyland and all of his contributions to the profession of Respiratory Therapy. The candidate should exemplify the great leadership skills and dedication to the profession that are representative of the characteristics that Gord possessed.

GET INVOLVED
Show your enthusiasm as a Respiratory Therapist by becoming engaged with the RTSO.

Become a regular contributor to RTSO Airwaves. From a simple picture snapped at a medical event, an article you would like to have published, to a question you would like to pose to the membership. Send it to us and we may publish it. (Please note, the RTSO reserves the right to approve all submissions prior publication)

Want to volunteer on a committee? There is always something happening at the RTSO where your skills and abilities may be required on a volunteer basis. The RTSO Education Forum, Membership, and Marketing are just some of the areas of interest. If this is something you aspire to do, we want to hear from you.

Contact office@rtso.ca and say "I want to volunteer". We will get you started.