



# CJRT · RCTR

Spring 2006, Volume 42 (1)



Gold Coast, Australia

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The journal for respiratory health  
professionals in Canada

La revue des professionnels de la santé  
respiratoire au Canada



**Canadian Journal of  
Respiratory Therapy**  
**Revue canadienne de la  
thérapie respiratoire**

**Official Journal of the CSRT  
Revue officielle de la SCTR**

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## Welcome to the Spring Issue of the CJRT

As always, there are lots of exciting things happening in the world of respiratory therapy. In this issue we have articles from a Canadian RT about her experiences working in Australia; a statement from the CSRT regarding our participation in activities related to primary care reform; an interesting case study submitted by an Office of the Chief Coroner and an update on the upcoming CSRT Annual Education Forum in Saint John, NB.



Doug Maynard

CSRT Forum Organizing Committee members and CSRT staff at the national and local levels have been working hard to create a program that provides educational value, as well as some quality entertainment, headlined by the CBC's Arthur Black. Be sure to register early for the banquet, as space is limited.

We also have updates on some new partnerships, particularly our membership with the Health Action Lobby (HEAL). This is a powerful group of healthcare associations whose mandate includes promoting improved health human resource strategies. Membership in this group will give us an opportunity to add the voice of respiratory therapists to a group that has been very effective in lobbying for the interests of the practitioners within the healthcare system.

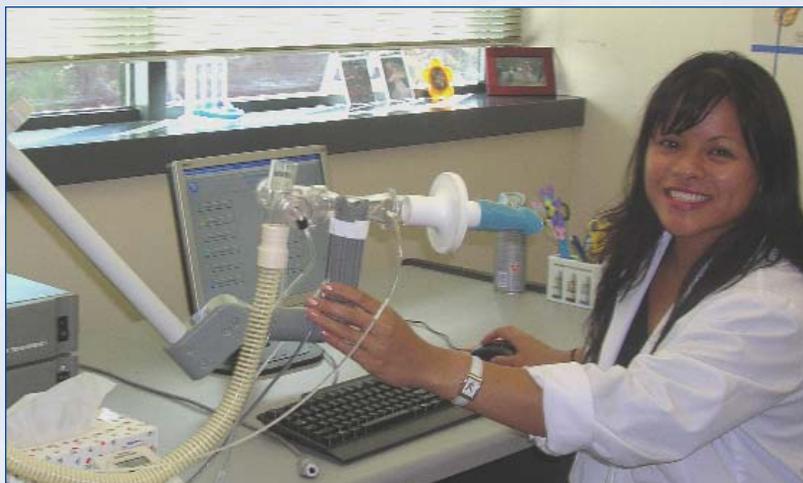
We also have an exciting development in our professional history. Long time CSRT member and author, Mike Andrews, has compiled an extensive history of the development of respiratory therapy in Canada, as well as the history of the development of the CSRT. The CSRT is working with Mike to publish the book and we expect to have it available at the 2006 CSRT Forum in Saint John, New Brunswick.

The CSRT Board and Staff look forward to seeing everyone in Saint John!!

Doug Maynard BSc, RRT, MBA  
Executive Director CSRT  
dmaynard@csrt.com

## RRT in the Land Down Under

Alison Pagsuyuin, RRT



Alison at work in her Gold Coast Clinic



Koalas are unique to Australia just like Alison

Australia — the land of kangaroos, hot sunny weather, the famous Ayers Rock and home to the unforgettable 2000 Sydney Olympics. As a 2003 graduate of the University of Manitoba Health Sciences Centre, in cold Winnipeg, Manitoba, I was intrigued with the prospect of leaving for greener (not to mention warmer) pastures for a while. What better place to start an adventure than the land called Oz!

After graduation, I worked as a General Duty Therapist at St. Boniface Hospital for a year and then moved to the intense, high-paced environment at Health Sciences Centre in both Children's NICU, PICU, and Women's Labour and Delivery. As well, I worked part-time at the Adult Intensive care units and volunteered at the Pulmonary Function Lab.

I started researching possible respiratory therapy jobs on the web in Australia. Curiously there appeared to be no RRTs! How could this be, I wondered? With the popularity of respiratory therapists in both

Canada and the United States, how was it possible that most Australians had never even heard of us — well respected and highly in demand therapists? Who was assisting in intubations, blood gases, pulmonary function tests, home care, oxygen titrations, emergency, resuscitations and ... gasp ... who took care of the ventilator settings? How could an intensive care unit even function without a respiratory therapist? It was all quite unthinkable!

My employment hopes were dwindling until I came across the Australia New Zealand Society of Respiratory Science (ANZSRS). All was not lost. There are "Respiratory Scientists" in Australia who specialize and train in Respiratory Physiology. ANZSRS is the equivalent to the CSRT in Canada. ANZSRS plays the important role of "promoting education and training in respiratory science and excellence in respiratory measurement fostering the exchange of scientific and technical information between members facilitating dialogue with other professional societies thereby leading

Respiratory Science in Australasia through the 21st Century."

If you check out the valuable CSRT website at [www.csrt.com](http://www.csrt.com) under "About CSRT", you will see that the CSRT is all about "Leadership through Advocacy, Service and Unity for Respiratory Therapists in Canada." Basically the same thing.

Like the CSRT website, ANZSRS has a heading for available jobs for respiratory scientists. I took my chances and applied for quite a number of available positions. Because I was applying from outside the country, many managers of the Respiratory Laboratories preferred to interview applicants who were already in the country with a valid working visa. Employers were generally looking for graduates with a science degree as well. Since I was the last year in my school of Respiratory Therapy to graduate with a diploma, I was out of luck for a lot of the jobs.

But my persistence paid off. I received an email from the manager

of Respiratory Clinic in beautiful Gold Coast, Australia! She was looking for a full-time permanent respiratory scientist to take over and run a private practice Respiratory Laboratory owned by a Respiratory Physician at a Medical Centre. I sent my resume via email with references from past employers, clinic specialists and not to mention a fantastic reference from the CSRT regarding our role as Respiratory Therapists here in Canada. I was offered an interview.

I had my doubts. Could I work in an atmosphere where there are no other RRTs? Even now it's still difficult trying to establish our excellent skills and abilities with nurses and doctors in the intensive care units. It continues to be an issue of demonstrating the quality of our education and training. It may take some time before we fully earn their trust as a profession.

In the end I made the difficult decision to leave my rewarding positions at the Health Sciences Centre, as I did indeed land the job in the Land Down Under.

I applied for and received a Working Holiday Visa from the Australian government. Working Holiday visas are only valid for one year and only once in your life. They can be applied for online through the government immigration website. Since I was to work in a hospital I needed a physical exam from my GP as well as a CXR for TB.

Once I arrived in Australia I applied for a Business Sponsored Migration Visa which would provide a visa that is good for up to four years. That required countless forms to be filled out by myself and my new employer. There were also expensive visa application fees. Unfortunately I hit a wall in that process. According to the government, I did not qualify for that visa because I only had two years post graduate experience not the required three years. However I

met the requirements for a Temporary Business Sponsorship visa. I was prepared with my up to date resume, references, original certificates of educational skills and criminal record checks. After a long process of reapplying and stressful waiting, I was granted my visa. Next year I will be eligible to apply for a sponsored migration visa.

As a respiratory scientist at John Flynn Respiratory Laboratory, I perform full lung function tests on outpatients and hospital patients including spirometry, diffusion capacity, nitrogen washout, normal saline challenges for possible asthmatics, and high altitude simulation tests (HAST). We also do EKG monitoring. I am in the process of getting Methacholine Challenges added to our list of available tests as well as get ABG sampling to be approved in the clinic but there is no blood gas machine here. Blood gases are sent to a pathology lab. On top of testing patients, I type up reports for the doctor, schedule appointments and basically do all the required paperwork needed to keep the clinic running.

Polysomnography tests and sleep apnea diagnosis are growing areas in Australia due to the overweight population. A lot of respiratory labs are also doing sleep apnea studies where patients are fitted with an Embletta machine overnight to measure O<sub>2</sub> sats, snoring, thoracic movement and pulse etc. This too will be part of our services in the year to come.

At times I do feel the need to keep my other skills up. I long to sneak into the intensive care units here and fiddle with the ventilators — even though they only have the older 7200's and Evita dura's. Sigh. See what I mean about expanding our expertise here? Do they even use newer ventilators like the 840...or what about the lifesaving oscillators and jet ventilators? Are they aware of the benefits of Nitric



Oxide? What about the newer modes of ventilation like PSV and PAV? These things I am still exploring. Since ANZSRS main role is in pulmonary function testing, I must dig deeper and speak with doctors and "respiratory nurses" who deal with ventilation. All in due time!

There are differences in the names of medications, doses, medical abbreviations I've had to familiarize myself with. I've also had to instruct a number of respiratory scientists and nurses in the proper technique of taking inhalers.

Because of my experience in emergency rooms, I suggested and organized emergency equipment for the lab in case of a patient crisis. I included a mini resuscitation kit complete with laerdol bag, oral airways, and rebreathe bags. That's all we are permitted to have right now.

As a young and growing profession RRTs need to unite. We need a body which represents our abilities, our strengths, our future goals, our past accomplishments and to promote our skills. That's why I believe the CSRT is an important association for

*Continued on next page 9*

## A Reflective History of the CSRT

The CSRT is very pleased to announce that the final touches are being added to a history book of the CSRT. *The Early Years — A Reflective History of the Canadian Society of Respiratory Therapists* has been painstakingly compiled by Michael Andrews, one of the founding members of the CSRT and a Past-President of the Society.

Mike has spent the past number of years conducting interviews, writing letters, collecting data and photos for this project. We officially launch our history book at the Wine and Cheese Reception, May 25, 2006 at CSRT Educational Forum in Saint John, New Brunswick. We invite you to come and meet the author. Books will be available through the CSRT booth.

Thank you Mike!

### Here is an Excerpt from His Book

"How then did the profession evolve? There is little recorded evidence of how a few "so called" oxygen orderlies gradually expanded their expertise so that physicians would be prepared to support their training and responsibilities. Bob Merry tells the story that following World War II he and a number of other army trained surgeons' assistants returned to Montreal at the Queen Mary Veterans Hospital but were not allowed to work as operating room nurses. Apparently, in Quebec in the mid-1940's, only women could be nurses! Consequently, these well-trained individuals had to be assigned to other tasks. As a result of reassignment, these individuals looked after oxygen tents, tank ventilators (iron lungs), delivered oxygen tanks to the wards, ensured humidifier bottles were filled with water, and helped maintain the anesthetic equipment for the operating theatres.

An early supporter of the field was Dr. R. G. B. Gilbert who organized an informal course for inhalation therapy technicians at the Queen Mary Veterans Hospital. Interestingly enough, some records suggest that Dr. Gilbert had trained orderlies to look after and maintain anesthesia and oxygen equipment since 1943! Graduates from that course included Robert K. (Bob) Merry, Jacques Parent, and Jim Sharkey. Another supportive physician was Dr. Alan Noble also of Montreal. In 1957, as Chief of Anesthesia at the Royal Victoria Hospital (RVH), he hired Bob Merry to head a newly created Department of Inhalation Therapy. A specific mandate given to Bob was to design a formal training program for new staff for the department. It is reputed this was the first Canadian School of Inhalation Therapy. The program was on-the-job training augmented with lectures from anesthetists, nurses and technical staff under the leadership of Bob Merry. Some of the graduates of the RVH program were Frank Bond, Merv. Green, Vic Parliament, Ian Reid and myself.



Although the on-the-job training was comprehensive and intense it was also fun! Ian Reid and I reminisced about some of the characters that worked in the department at that time. A particularly colorful person was Bob Boyd who provided many laughs but also good instruction. One evening I received a panic phone call from Bob. He asked me to please come in immediately. He blurted out that he had shot the phone. I was dumbfounded! It turned out that Bob was cleaning his hunting rifle when it discharged and destroyed the department phone. He quickly went to a vacant reception area and obtained a replacement phone. Bob Merry was never aware of some the antics Bob got up to!"

While the beginnings of the profession were occurring in Montreal, the polio epidemic of 1953 in Alberta would also have a major impact on the evolution of the role of the inhalation therapist. That year there was an unprecedented incidence of patients suffering from respiratory paralysis as a result of poliomyelitis. As a consequence, the Royal Alexandra Isolation Hospital would become the referral centre for Edmonton and Northern Alberta.

Since respiratory paralysis was usually progressive, patients required at least temporary ventilatory support. Equipment in those days included the Nuffield iron coffin (perhaps a poor choice of name!), Drinker-Collins iron lung, Emerson iron lung, chest cuirasses, rocking beds and direct positive pressure devices such as the Haliburton positive pressure ventilator. One particularly frightening device that was used to create a sudden burst of negative pressure to aid expectoration was the Cofflator. This device is apparently making a comeback!

Dr. Brian Sproule tells of the time that he tried out the rocking bed that was given to the RAH. He "rocked" for thirty-five minutes and to his own humiliation, but to the delight of his co-workers, he promptly suffered projectile vomiting!"

## On Air Nuggets

### CSRT National Certification Examination

The sitting of the next CSRT National Certification Examination is July 10, 2006. The deadline for application is April 30, 2006. Please check the CBRC website for details [www.cbrc.ca](http://www.cbrc.ca)

### On-Line Membership Renewals

In our continuing commitment to offer our members the services they wish to receive, the CSRT is now offering on-line registration for membership renewals. There are some limitations to membership renewal with regard to liability insurance. Visit our website at [www.csrt.com](http://www.csrt.com).

### Professional Development

Visit the newly enhanced Continuing Professional Development area on the CSRT website. Check under Education on the site. It has been updated with a variety of educational offerings to fit virtually all continuing educational needs. Whether you want to read a quick article while riding public transit to or from work or wish to refresh some concepts you encountered in the workplace, this area has something for you ... and it's all free!!

### Survey Winner

Congratulations to our CSRT Membership Survey winner. Kenneth Ritchie of Barrie, Ontario wins a set of CSRT scrubs and complimentary registration to the May 2006 CSRT Educational Forum in Saint John, New Brunswick. We thank all those who participated. Your feed-back will help us better serve our membership.

### Educator's Congress — Full Day of Sessions

CSRT is once again offering an Educators' Congress in conjunction with the CSRT Educational Forum. This year it will be a full day of sessions and workshops on May 25, 2006 at the Saint John Trade and Convention Centre.

Please check page 20 for details and a registration form. Space is limited. Register early to learn the latest and most innovating approaches to teaching.

### Advocacy Committee Welcomes New Member

Christina Beaudin of Ottawa has joined the CSRT's Advocacy Committee. The CSRT is extending the opportunity for additional volunteers to sit on this vital committee. For details on the Committee's activities and on how to apply to become a member, go to the CSRT's website homepage ([www.csrt.com](http://www.csrt.com)), click on Committees/Advocacy Committee. Thank you and welcome, Christina!

### Land Down Under *continued from page 7*

all RRTs. There is strength in numbers. We need a strong voice to show the world what we can do; to demonstrate our value to the medical society. Even now it is difficult for Canadian RRT graduates to work in the United States — our very own neighbors! Why? Because apparently we're not even part of the free trade act. To be able to expand our skills and careers around the world, our qualifications need to be recognized as equal to respiratory therapists in the United States. Our education is equivalent and I believe in some cases we are better trained!

We owe it to the betterment of society to use our skills to teach and inform others. It concerns me to think that individuals not educated and specialized in respiratory therapy are dealing with patients in respiratory distress. I believe the medical world would be a better place with more RRTs. We worked too hard to get to where we are today not to believe that. We are a very important part of the medical team. We have to make others believe too.

There is so much potential for respiratory therapists here in Australia as well as in Asia. We could expand into all different areas that need our expertise — not only in the intensive care or pulmonary function clinics, but the sleep disorder centres, the home care section, and even sales of respiratory supplies to name of few.

We need Respiratory Therapy schools in the universities. There are doctors and Respiratory Scientists out here who will support that movement. I am very willing to support and promote our skills in Australia and beyond.

My message to RRTs in Canada is to be proud of your skills and your contribution to the medical world. We are luckier than we realize. Until next time....I'm off to the beach now!

## Message from the President

Respiratory therapy in Canada has come along way, but still there are many bumps along our path to success.

Advocacy is the one of our key goals, which also serves the profession on so many levels. The position of President or Director on the CSRT Board allows each one of us to give and receive. In terms of giving, we provide a different viewpoint depending on our experience in the profession, depending on what area of the country we live in and what our life experience has taught us. In terms of receiving, each one of us as a Director or President on the Board receives an invaluable experience in participating as a cohesive board with clearly focused goals, being able to network with colleagues across the country and have a better understanding of the political landscape in terms of promoting our profession.

Eighteen months into this term of President-Elect, President and Past-President, I feel the Board has accomplished a great deal and we are focusing on items, which directly relate to the strategic plan.

The CSRT is beginning to position itself in the political spectrum, as you will see outlined in the journal. We have created partnerships with important organizations that will be beneficial in promoting our profession. New promotional materials have been generated creating easy to obtain packages for different markets promoting the profession to the public, potential students, hospital administrators and politicians.

Listening to the members is also one of the top priorities relating to one of the goals, providing member services. The latest survey results have

provided the Board with information that will help us develop the services you want as members. Clearly the CSRT has been lagging in the development of services such as "best-practice guidelines" and a data base where information can be easily accessed, both of these items seems to be one of the common themes in the survey results. The Director of Member Services will be collating all the information and results from the survey and the board will set about the task of prioritizing and acting on these results.

Allowing each Director to develop workplans and provide written reports to each Board meeting keeps us accountable to each other and to you as a member.

I truly believe we are moving in the right direction with the help of all the Board members, the Executive Director and the CSRT office staff. Our profession will be heard! Respiratory therapists are a vital part of the healthcare team and soon we will become recognized in the public and government's eyes with our increased diligence on promoting our profession and working with our provincial partners.

### Mot de la présidente

Quoique la thérapie respiratoire ait beaucoup évolué, il y a encore bien des nids de poule sur la voie du succès. En plus de constituer un de nos principaux objectifs, la défense des intérêts est bénéfique à la profession à plusieurs niveaux. Les postes de président et d'administrateur au conseil d'administration permettent à chaque personne de donner et de



Sue Jones

recevoir. Nous contribuons une perspective différente en fonction de notre expérience professionnelle, du lieu géographique où nous habitons et des leçons de vie que nous avons intégrées. D'autre part, chacun de nous, administrateur ou président, retire de l'expérience précieuse grâce à sa participation à un conseil d'administration homogène qui travaille vers l'atteinte d'objectifs ciblés, aux occasions de créer des réseaux avec ses collègues de partout au pays et à sa nouvelle compréhension du paysage politique aux fins de promotion de la profession.

Après 18 mois de ce mandat de présidente désignée, présidente et présidente sortante, je constate que le conseil d'administration a accompli beaucoup de choses et qu'il mise sur les initiatives qui sont directement liées au plan stratégique.

Comme vous le constaterez en lisant ce numéro du journal, la SCTR commence à se positionner sur la scène politique. Nous avons créé des partenariats avec d'importants organismes et ces liens faciliteront la promotion de notre profession. Grâce au nouveau matériel publicitaire, il est facile de préparer des troupes de promotion en fonction de l'auditoire cible, soit le public, les étudiants éventuels, les administrateurs d'hôpitaux et les politiciens.

*Continued on page 13*

# CSRT Human Resources Report

Sandra Biesheuvel, CSRT Director of Human Resources

The CSRT has been an organization of great change and growth over the last few years. The amount of time and energy that has gone into the “new CSRT” demonstrates the passion and dedication of all of the individuals who have been involved with the CSRT in recent years. The new structure of the CSRT has created portfolios for each Director’s position outlining goals and objectives. The work of each Director reflects the new mission statement of the CSRT to serve, unite and advocate for the respiratory therapists in Canada.

During my term as Director of HR, the Standards of Practice document was revised, and a new Code of Ethical and Professional Conduct document was created. I believe that both documents outline the high professional standards under which we practice and the important contribution that respiratory therapists make to the care team. Both of these documents are on the CSRT website.

The nomination process of the Board was reviewed, and a policy and procedure has been developed to outline the process by which individuals are nominated. A nomination committee will lead this process to ensure that there is a formal, transparent procedure for the appointment of individuals to the CSRT Board of Directors. The nomination committee will consist of Past-Presidents of the CSRT. This committee will have the responsibility for assisting with recruitment of potential candidates, keeping in mind the vacant positions and skill mix of the individuals on the Board. With a committee dedicated to recruiting nominees, it is anticipated that more members will be exposed to the Board of Directors and there will be a greater interest in the membership in taking a position on the Board. This will maintain the diversity of the Board of Directors and infuse

new ideas for the implementation of the strategic plan.

Another project that I hope to have completed by the end of my term in May is the creation of an orientation manual for new members of the CSRT Board of Directors. It is difficult to develop goals when you don’t know what the person before you accomplished. The “board book” will contain current policies, job descriptions, the strategic plan and other important documents of the CSRT. Each new director will also receive a copy of the work plan of their predecessor so that there is continuity from one board to the next.

My view of the Human Resources portfolio is that it is somewhat of a “housekeeping” position. The Director is responsible for the policies, bylaws, and nomination process of the CSRT. A goal common to all positions on the Board is to promote membership and attract volunteers. The most difficult task of being a member of the Board of Directors is recruiting for positions on the Board as they become vacant. Each member is somewhat responsible for recruiting for their own position when their term is ending. This is not an easy task. We all have commitments to our families, employers and the community in which we live. It is difficult to try to convince someone to volunteer for a position that requires a significant amount of

time. The benefits, however, are many. The experiences and lessons learned will last a lifetime. I have been privileged to meet some outstanding people from across Canada who are dedicated to advocating for our profession. I extend my congratulations to Jim Winnick, Brent Kitchen and Sue Jones, who, with their amazing leadership skills, have guided us through the transition period of the new structure of the CSRT. Doug Maynard, the Executive Director of the CSRT has worked hard to strengthen the relationships that the CSRT has within the health-care community and develop new ones as the CSRT continues to grow its membership.

As my term is ending in May, my report would not be complete without thanking my family for their support. I did not seek this position on the Board of Directors it came looking for me. Perhaps it wasn’t the best timing to take a position on the Board after moving to a new city with a new baby, but I do not regret my decision. My small contribution to the CSRT has been one of the most satisfying aspects of my career. To state a quote that I have in my office: “when we accept tough jobs as a challenge...and wade into them with joy and enthusiasm, miracles can happen. When we do our work with a dynamic conquering spirit, we get things done.”

## CSRT Corporate Members 2006

Cardinal Health	Methapharm
Carestream Medical	ProResp/ProHealth
GE Healthcare	Radiometer Canada
Instrumentation Laboratory	Respan Products
	VitalAire Canada

This is part of a series of Provincial Reports from across Canada. Future issues will include reports as they become available.

## Report from New Brunswick Association of Respiratory Therapists

Kathy Kowalski, RRT, President NBART

### Executive

President: Kathy Kowalski RRT  
 President Elect: Vacant  
 Past-President: Bill Koval RRT  
 Secretary-Treasurer: David Arbeau RRT

On behalf of the New Brunswick Association of Respiratory Therapists, it is my pleasure to submit the following report of our activities.

### Fellow CSRT Members

It has been a busy year for the NBART. We are preparing for the 2006 CSRT Education Forum and continue our push for Licensure.

### CSRT Forum May 26–28, 2006

The Chair of our Organizing Committee for the CSRT Education Forum is Katrina Madsen. She is doing a tremendous job, organizing the various working groups and coordinating with the CSRT Office. At this time, the Forum schedule is set, the speakers confirmed and plans by the Social Committee are

progressing well. We all appreciate Katrina's efforts and her gentle prodding in getting the job done.

The Education Committee has made a concentrated effort to appeal to respiratory therapists in all aspects of the profession. There is a diverse selection of education topics for attendees.

We are looking forward to hosting this year's forum and demonstrating the Maritime hospitality!

### Provincial Issues

RTs within the province awarded John Doucet the RT of the Year Award for his work with continuing education. A few of the highlights of his nomination identify that John is an ACLS Instructor Trainer, PALS Instructor Trainer and as an instructor for the Critical Care Nursing Course in New Brunswick. He is also the preceptor for Respiratory Therapy students in his Region. Congratulations John!

We have established two different special interest groups on a Provincial basis: The PFT Group and the Asthma/COPD Group. The Asthma and COPD Group has expanded to include Educators from PEI as well as linkages with the Lung Association. These groups are working to standardize practice and maintain best practice.

The NBART is still working toward Licensure. This is a very slow process within this province and we continue to "plug away".

The NBART membership has made a decision to increase the use of our Website and other electronic communication. This is a work in progress and we look forward to the enhanced communication that this will allow us, as well as the cost savings that it will provide.

### Mot de la présidente *Continued from page 10*

Être à l'écoute des membres constitue également une priorité. Cela s'insère dans un autre de nos objectifs, soit le service aux membres. Les résultats du dernier sondage permettront au conseil d'administration de développer les services dont les membres aimeraient se prévaloir. Il est évident que la SCTR accuse un certain retard au chapitre de l'élaboration de services telles que des « directives liées aux pratiques optimales » et une base de données qui permet l'accès facile aux renseignements. Ces deux exemples reviennent souvent dans les résultats du sondage. Le directeur des services aux membres est responsable de recueillir les renseignements et les résultats du sondage afin de permettre au conseil d'administration de prioriser les résultats et passer à l'action.

La pratique selon laquelle les directeurs préparent des plans de travail et soumettent des rapports écrits à chaque réunion du conseil d'administration nous responsabilise l'un l'autre et devant les membres. Je suis convaincue que nous sommes sur la bonne voie avec l'aide de tous les membres du conseil d'administration, du directeur général et du personnel au bureau de la SCTR. Notre profession se fera entendre! Les thérapeutes respiratoires, membres essentiels de l'équipe de soins de santé, seront bientôt reconnus à ce titre par le public et le gouvernement, grâce à nos efforts soutenus de promotion de notre profession et au travail que nous effectuons avec nos partenaires provinciaux.

# Report from Respiratory Therapists Society of Nova Scotia

Carol Donaldson RRT, President RTSNS

## Executive

President: Carol Donaldson  
Past President: Rhonda Burke  
Treasurer: Trish Moriarity  
Secretary: Jennifer MacKinnon  
Directors-at-Large: Barb MacDonald  
*Wendy Conrad, Vanessa Friesen  
(students)*

The RTSNS focus this past year has been on obtaining self-regulation. Members of the executive have met with representatives of the Ministry of Health and have been encouraged to prepare for legislation to be drafted and presented to the Legislature. The executive has reviewed and revised our by-laws and standards of practice and are developing a scope of practice to base our legislation on. We are excited that after numerous years of pursuing this goal we are finally within reach of it. I would like to thank not only the members of the executive for their tireless efforts towards this goal, I would also like to thank Phil Richardson for the many years of active pursuit and his current advise

and wisdom. Without the efforts of so many in the Nova Scotia RT community over the years we would not be so close. I thank you all.

## Website

We are also working on up-dating our provincial website. We are hiring a designer to help restyle and update this vital communication tool. Over the next several months we will be using this tool as a vital means of keeping the membership current on self-regulation. We hope this tool will enhance our communication within our province.

## Biennial Forum

Also in the planning phase is our biennial Educational forum planned for the fall of 2006. Our last forum in 2004 was well attended with many wonderful speakers. We are hoping to surpass that this year. As a small province we are faced with a limited pool of RRT's from which to draw volunteers to assist in advancing the practice of respiratory therapy in

Nova Scotia. Any members who wish to assist in planning this important educational (and of course social) event are encouraged to contact any members of the executive.

I feel very proud and honoured to be able to represent Nova Scotia on a national level. I am enjoying the work and communication being done by the House of Delegates with the CSRT. Being able to share ideas, problems, and solutions with the RT community as a whole is a wonderful opportunity to enhance the growth of respiratory therapy, not only here in Nova Scotia but throughout the Country.

Our next AGM will be in the spring, I encourage all RRT's in Nova Scotia to attend. Check your mail for important information regarding self-regulation over the coming months. Again, thank you to everyone who has volunteered their time and resources to the RTSNS this year and encourage anyone who wishes to participate to contact the executive.

## Calendar of Events

March 3 – 7, 2006  
**American Academy of Allergy,  
Asthma and Immunology Annual  
Meeting**  
Miami Beach Florida  
<http://www.aaaai.org/>

March 23 – 25, 2006  
**National Heart Foundation  
Conference  
Sydney Australia**  
<http://www.heartfoundation.com.au/2006conference/>

March 23 – 26, 2006  
**The Fourth European Respiratory  
Society Lung Science Conference**  
Taormina, Sicily  
[www.ersnet.org/ers/](http://www.ersnet.org/ers/)  
March 24 – 28, 2006

**80th Clinical and Scientific Congress  
of the International Anesthesia  
Research Society**  
San Francisco, California  
[www.iars.org](http://www.iars.org)

March 28 – April 6, 2006  
**Keystone Symposium — Advances  
in Influenza Research**  
Steamboat Springs, Colorado  
[www.keystonesymposia.org](http://www.keystonesymposia.org)

April 2 – 5, 2006  
**8th World Conference on Injury  
Prevention and Safety Promotion**  
Durban, South Africa  
<http://www.safety2006.info/index.aspx>

April 6 – 11, 2006  
**Allergy, Allergic Inflammation and  
Asthma**  
Beaver Run, Colorado  
[www.keystonesymposia.org](http://www.keystonesymposia.org)

April 20 – 22, 2006  
**6th Annual FOCUS Conference**  
Nashville, Tennessee  
<http://www.foocus.com/>

April 24 – 28, 2006  
**Society for Obstetric Anesthesia &  
Perinatology, 38th Annual Meeting**  
Miami Beach Florida

April 24 – May 1, 2006  
**Tuberculosis 2006 Conference**  
Kololi, Gambia  
<http://mangosee.com/mangostee>

## Nominees for CSRT Board Positions

CSRT Members have put their names forward to volunteer for various important positions on the CSRT Board of Directors. Here are their thoughts on positions for which they have applied.

### Nomination for President Elect — 2006

Colya Kaminiarz, RRT

I am honoured to let my name stand for nomination as president elect of the Canadian Society of Respiratory Therapists for 2006. I graduated as a Respiratory Therapist in 1996, and since that time have worked in a community based hospital, tertiary care centre, as well as an anesthesia assistant. I am presently a clinical instructor for Thompson Rivers University at Vancouver General Hospital.

My formal involvement with the CSRT started in 2000, with the formation of the CSRT Anesthesia Special Interest group. Over the next six years, first as a director at large, then director of membership services I have seen the CSRT go through many changes. Through a change in board structure, a change in membership criteria, a commitment to completely leave its de-facto regulatory role, and a head office reorganization the CSRT continues to evolve

into a truly membership focused organization, representing its members in all parts of Canada. I have seen the CSRT form partnerships with organizations throughout the country to ensure that Respiratory Therapists are seen as a vital part of the health care system. The CSRT is now working collaboratively with the Respiratory Therapy Regulators and provincial societies on common issues facing the profession.

The presidents & boards that I have worked with over the past 6 years have shown incredible vision, and a willingness to make decisions, some quite difficult, that they saw benefiting the member RTs across the country. The new CSRT mandate focuses on Service, Unity, and Advocacy for Respiratory Therapists in Canada, and I have seen that mandate reflected in every decision the board takes on behalf of the membership.

I think the direction the boards have chosen for the CSRT has been the right one. I will continue to work towards an understanding that there is more to healthcare than “doctors and nurses” to ensure that Respiratory Therapists are seen as the vital part of healthcare that they are. I will continue to work towards the CSRT offering services that you as a member request to support you in your professional activities.

I want to thank Tom Dorval, Daniel Paré, Eleanor Lord, Bob Reid, Jim Winnick, Brent Kitchen and Sue Jones for the leadership they have demonstrated over the past 6 years, and to the mentors they have been. They leave some incredible “shoes to fill” but if elected I will do my utmost to carry out the vision they have shown.

## Nomination for Director of Human Resources

Wayne Norquay, RRT

As a profession, respiratory therapy has a diverse skill set, a scattered population and a job role that is little known outside healthcare. This environment creates a unique set of challenges to a relatively new and dynamic discipline. I hope my experience and unique point of view will aid in career opportunities for our members and connect perspective employers to a valuable resource.

I have spent the last three years in the position of Vice President within my local union. This opportunity has given me an important perspective on workers needs and expectations. I hope to continue to monitor these requirements in the future and help wherever I can. I strongly believe a workforce that feels protected and respected will also be productive.

Through my dealings with the union I have had the opportunity to view management from the inside, as they struggle to meet the delivery needs of a quality healthcare system. One of the main issues they face is asset allocation. The key question is: Where can each individual be most effective? Our job role is very plastic in nature. From region to region, it has changed and adapted to the demands of its employer, but we as a profession must do more. The health care industry should be informed of what unique skills our profession brings and which areas of the healthcare system these skills can be applied to. The proper allocation of respiratory therapists has the ability to reduce wait times, reduce waste in wages, and may in fact increase the demand for qualified respiratory therapists. I hope to be able to aid local and region departments in rationalizing their

services before “restructuring” leads to a crisis.

Where can our profession go in the future? That depends on education. Ensuring our schools produce quality therapists is important. Institutions must verify that their curriculum continues to reflect the needs of industry. It is my hope to create open and effective communication that will bridge the gap between industry and institution.

As the Director, I will have the ability to bring down barriers that may be hindering our colleagues from getting the most out of their career. My experience and views can only enhance the portfolio of Human Resources. I hope that with your support, I can serve you well in the future.

---

## Nomination for Director of Professional Advocacy

Lisa A. Butcher, RRT

I am a respiratory therapist at Credit Valley Hospital in Mississauga, Ontario. I graduated from the Mitchener Institute in Toronto in June 2004 and have been a registered RT since July 2004.

In addition to my education in respiratory therapy, I also hold an Honours Bachelor Degree from the University of Toronto. I was the recipient of the J. Harry Ebbs Award for Outstanding Academic Achievement at the University of Toronto in 1999.

Although I am new to the profession and have a lot to learn, I am passionate about playing a role in the advancement of our field. For the second consecutive year, I have been a member to the Critical Care Committee at Credit Valley. This committee is a multi-disciplinary group responsible for organizing Credit Valley's first annual Critical Care Conference, held in 2005 at the Mississauga Convention Centre.

I am interested in becoming the Director of Professional Advocacy because I would like to be directly

involved in the promotion of our profession. I have been a member to the CSRT since I was a student in 2003 and have attended the CSRT Forum for the past two years. I believe in the importance of our role as RRT's in healthcare across Canada. I look forward to advancing our profession together.

# Nomination for Director of Education and Clinical Standards

Cary Ward, RRT

The CSRT, which advocates and represents respiratory therapists nationally and internationally, also plays an important role in providing input at the Alliance table for the non-regulated provinces. One of the key components that your Society provides is a true national credentialing through the certification exam provided by the CBRC.

The Director of Education provides guidance for continuing education, CoARTE (accreditation arm), foreign credentialing and the development of clinical practice guidelines, standards of practice and professional enhancement. The Director must also understand the regulatory bodies and provincial associations on issues of education and clinical standards.

The Director must possess a strong understanding of the principles of education, credentialing, make-up of the regulatory colleges and have demonstrated professional commitment, leadership, organizational and communication skills. I believe that my active involvement for the past 27 years provides me with the knowledge and skills needed to represent you as the Director of Education and Clinical Standards.

## My Education

- 1975 — Honors BSc, University of Guelph (Ontario)
- 1978 — Diploma in Respiratory Therapy, Michener Institute
- 1997 Registered Polysomnographic Technologist, Association of Polysomnographic Technologist
- 2001 — Teachers of Adult Certificate, Cambrian College, ON
- 2005 — Master's of Education, Nipissing University, ON

I have a solid understanding of the duties and responsibilities of a respiratory therapist. I have been at the bedside in the role as clinical coordinator and part time staff therapist. Sudbury's hospital has gone from 8 hours/day five days a week with 4 therapists to 24/7 with over 40. In that time, I have been involved with the development of clinical practice guidelines and standards of practice. For the last 7 years I have taught full time, as a staff member, at Canadore College. I understand the accreditation process and since January of this year I have been appointed as coordinator of the program.

Professionally I have always supported and advocated respiratory therapy. I have been Coordinator for 2 provincial 3-day educational meetings and been a member on the Board of the RTSO for six years. I was involved with the development of the Ontario's RHPA that now regulates the province's respiratory therapists. I have always supported the national exam of the CSRT as the entry to practice in the province of Ontario. Even when I was on the

Board of the CRTO (1994–2000) I was always supportive of motions of retaining the national exam and having good workable relations with the CSRT. By being on the Board of the CRTO I understand the workings of a regulatory province and the position that the CSRT has at the Alliance table.

The Alliance has been active with the development of the National Competencies Profiles that all schools are incorporating into their courses. Presently the Alliance, with guidance from the CSRT, is in their infancy in developing evaluation processes for these competencies. My Master's program emphasized curriculum development and evaluation. My thesis is on competencies testing using OSCEs, something that the Alliance should consider. Also, important now, is the development of Foreign Credential Recognition.

I look forward to working with the rest of the BOD to advocate and improve the profession.

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## Nomination for Director of Membership Services

Patty Wickson, RRT

My passion for the profession as a respiratory therapist started back when I graduated in 1991 from Cariboo College in Kamloops, BC. It is hard to believe that it has been 15 years now. I remember my first job at BC Children's Hospital where I thought, "I may stay here for five years and then see where the profession takes me." I ended up staying there for nine years. I worked in both the pediatric and neonatal units as well as the special needs unit and then progressed to Supervisor of NICU for four years. I was then fortunate to get a casual position at a small community hospital in Ridge Meadows, BC. We had built a new home in this community to raise our child and the commute to downtown Vancouver was getting very long. At Ridge Meadows, I gained experience with adults in many areas of care including ICU, Wards, ED, Pulmonary Function Lab, Asthma/ COPD Rehabilitation Programs, Bronchoscopy Lab and the Tracheostomy Clinic. I quickly moved to a permanent position and then become the Manager of Respiratory Services for two years.

I was nominated at an AGM for President-Elect for the BC Society of Respiratory Therapists in 1998 which I accepted. I was told it was easy and I could delegate work that needed to be done. If only that statement was true. I gained valuable insight and credibility within our profession over the 4 years of my term. Some accomplishments included; participating in the national meetings that focused on the Agreement on Internal Trade, specifically the Mutual Recognition Agreement, as well as participating in the National Competency Profile development. Our focus was on regulation for Respiratory Therapy in BC, specifically rewriting and submitting the

final document and participating in the hearing, reviewing the proposed reserved and restricted acts outlined in the Health Professions Act for our profession. In my term as President-Elect and President I had two more children to bring the grand total to three. As Past-President, the board had approved the development of the College Task Force Committee which worked arms length from the Society. The prime focus of the committee was to support regulation and to develop the first Bylaws for submission to the government. I served as Chair of this committee for two more consecutive years.

Our family then relocated to Calgary, Alberta in 2004 so my husband could further his career. Once settled, I was employed at the Calgary Health Region working in the pulmonary function labs as casual while seeking out the right opportunity to further my career. I was successful in the competition for a temporary Supervisor position for ED/Wards at the Peter Lougheed Centre. I then had an opportunity to work part time as Supervisor of Pulmonary Function Lab, as well as working in the Asthma Clinics at the Alberta Children's Hospital. As luck would have it, the Supervisor Position for ED/Wards at the PLC opened up

permanently, and I was the successful applicant effective September 19, 2005. I have enjoyed the role, challenges and people that I have worked with over the last 4 months. I feel that there are many exciting opportunities and challenges that lay ahead for our profession and look forward to these changes in my role.

As well, I am presently volunteering my time, along with Gil Vergilio, to work towards the development of a Leadership Special Interest Group for our profession. This has been put forward and pursued for a few years now by a number of leaders in our profession. A business meeting will be held at the CSRT Forum in New Brunswick in May to discuss the formation of a board, and the future of this group. If you are interested, we would love to see you attend.

I am specifically interested in getting involved again as a volunteer in our profession, and expanding my knowledge and contacts within the CSRT. I still feel as passionate as I did when I graduated, and believe that we are just scratching the surface of where our profession will take us in the future. I look forward to my two-year term and working with the board of directors on the CSRT to make a positive impact in our profession.

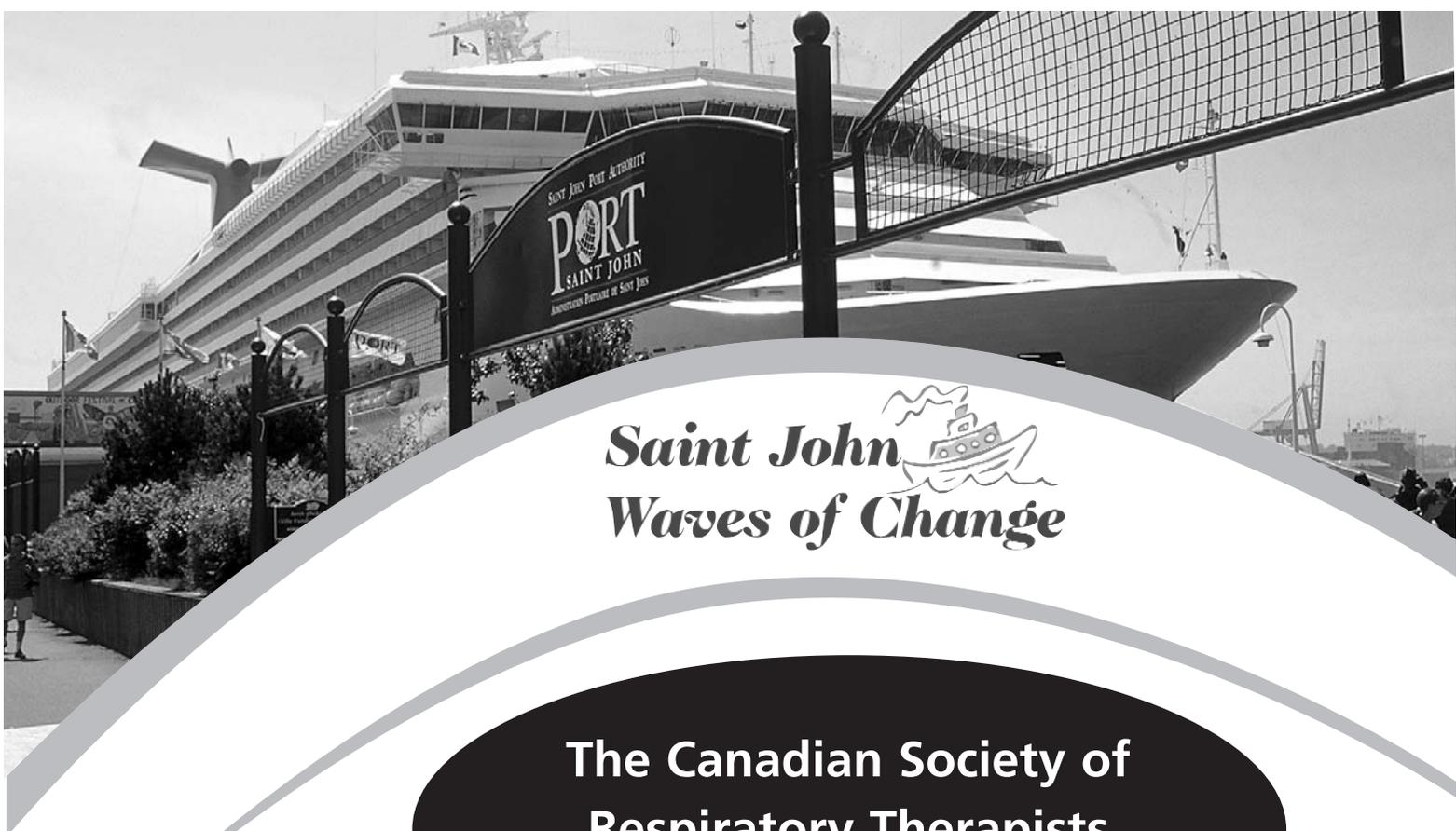
### Sputum Cup Challenge

Saturday May 27 11:30 – 12:30 Exhibit Hall

**Respiratoranium!** (based very loosely on the board game — Cranium)

It could hurt your brainium! Faster than a scavenger hunt. More conniving than Simon Says. More competitive than musical chairs. Gather up a team of four and participate in the outrageous to the sublime — humming, whistling, sketching, sculpting, acting and perhaps even spelling backwards to win. Registration forms will be available at the Registration Desk in Saint John.

Winners get free registration to Forum 2007.



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# CSRT Educational Forum Preliminary Programme

## MAY 25, 2006 THURSDAY

### Educator's Congress *(See Page 24 for Separate Registration)*

- 8:00 – 8:30 am      **Registration — Meet and Greet**
- 8:30 – 8:45 am      **Welcome and Opening Remarks**  
Carolyn McCoy BHS RRT RPSGT, Coordinator/Instructor, Respiratory Therapy Program, NBCC, Saint John
- 8:45 – 9:45 am      **The Brain and Learning**  
Ian Patrick BA MEd
- 10:00 – 11:00 am    **Development of an Advisory Council**  
Ray Hubble RRT MMed, CSRT Director of Education and Clinical Standards
- 11:15 – 12:15 pm    **Lecture 3**
- 12:15 – 1:15 pm     **Lunch**
- 1:15 – 4:00 pm      **Best Practices Workshop**  
This interactive workshop is a chance for Respiratory Therapy educators to break into smaller groups and discuss best practices in a variety of areas. Topics for discussion include Implementation of the National Competency Profile, Preceptorship training, Medical Simulation, Logbook design and use in the clinical setting, Performing and documenting clinical evaluation and more. Participants will be asked to share original or innovative teaching and evaluation tools.
- 6:00 – 9:00 pm      **CSRT Complimentary Wine and Cheese Reception — Book Launch for CSRT History Book and Opening of Exhibits**

## MAY 26, 2006 FRIDAY

- 7:30 – 8:30 am      **Exhibitors' Breakfast**
- 8:30 – 9:00 am      **Opening Remarks**
- 9:00 – 10:00 am     **Keynote Speaker: Sean Swarmer**
- 10:00 – 11:00 am    **Keynote Speaker: Carl Wiezalis, MS, RRT**  
Ethics, Professional Behavior and Cultural Diversity in the Respiratory Therapy Profession  
The foundation for technical and clinical performance of the tasks and responsibilities collectively called "Respiratory Therapy" is most appropriately and effectively built upon a foundation of scientific truth and sensitivity to the needs and desires of the communities served by the profession. The practitioners of a profession are called "professionals" and medical professionals are expected to conduct themselves in a manner consistent with the historical and contemporary standards of the community. As most allied health specialists are directly derived from the concept of "physician", the community expects respiratory therapists to practice philosophies, attitudes and behaviours consistent with codes of conduct elaborated by and for physicians over the centuries. The speaker will also weave concepts related to "diversity" into the theme of ethics and professional behaviour.

# CSRT Educational Forum Preliminary Programme

11:00 – 12:30 pm **Lunch with Exhibitors, Exhibit Hall**

12:30 – 1:30 pm **BREAKOUT SESSION 1**

**MODULE A** — Dr. Christer Sinderby, MSc, PhD

### **Neurally–Controlled Ventilation**

Neurally adjusted ventilatory assist (NAVA) is a mode of mechanical ventilation where positive pressure is instantaneously applied to the airway opening in proportion to the electrical activation of the diaphragm (EAdi) (*Sinderby et al*, 1999 Nature Medicine). The EAdi represents the patient's respiratory drive. Hence, during NAVA, the ventilator support is synchronous with and proportional to the respiratory drive and therefore acts as an external "respiratory muscle pump". The amount of assistance delivered by NAVA is determined by a proportionality factor determining the magnitude of pressure delivered for a given EAdi amplitude. Current studies in animals and adult patients show the feasibility of implementing NAVA clinically. NAVA offers synchronized assist in direct proportion to the needs of the patient, and due to its unique pneumatic–independency, is not affected by leaks. This opens up the possibility of delivering synchronized non–invasive mechanical ventilation. Besides the use of the diaphragm electrical activity to control the respirator, simply monitoring the EAdi can provide useful information about the effects of various treatments and interventions.

**MODULE B** — Ann Hudson Mason

### **Neonates**

**MODULE C** — Dr. Glen Sullivan

### **Level III Sleep Studies**

**MODULE D** — Carl Wiezalis, MS, RRT

### **New Initiatives and Perspectives on COPD**

All Respiratory Therapists know that the prevalence of COPD has been increasing throughout the world in both developed and under–developed nations. The World Health Organization (WHO), together with the US Heart, Lung and Blood Institute, NIH, developed new guidelines for the diagnosis and care of individuals at risk for COPD which is rapidly moving into the fourth position as a leading cause of morbidity and mortality throughout the world. Over a hundred nations around the world, including Canada, have partnered with the WHO to advance the GOLD Guidelines. As a result of this initiative, a not–for–profit, patient–centered organization was formed to promote self–care and peer support for patients and families suffering from COPD. This new organization called the National Emphysema/COPD Association (NECA) conducted the largest survey of COPD ever conducted in the United States. Six separate surveys were directed to pulmonologists, family practice physicians, three cohorts of COPD patients and respiratory therapists. This lecture will introduce this professional audience to NECA, a global association and reveal some of the important data derived from this complex survey process.

1:30 – 2:30 pm **BREAKOUT SESSION 2**

**MODULE A** — Janette Reyes, RN, MN (ACNP)

### **Pulmonary Arterial Hypertension: Care of the Child**

It is difficult to imagine anything worse than a person being diagnosed with a rare, progressive and incurable illness. One can only admire the courage of a child who lives through the course of this disease. Understanding the pathophysiology and knowing the symptoms of pulmonary hypertension will provide a rationale for the multiple diagnostic tests necessary to isolate the diagnosis. Although there is no cure for PAH, there are medical therapies available that can delay the progression of the disease and improve quality of life. Lung or heart/lung transplantation is the ultimate treatment option for end stage disease. Research investigations continue with the hope of conquering this dreadful disease.

## CSRT Educational Forum Preliminary Programme

- 1:30 – 2:30 pm      **MODULE B** — Dr. Robert Horton  
**End of Life Planning COPD**
- MODULE C** — Dr. Dennis Bowie  
**Steroid Resistant Asthma**
- MODULE D** — Rick Paradis  
**Airway Olympics**
- 2:30 – 3:00 pm      **Refreshment Break, Exhibit Hall**
- 3:00 – 4:00 pm      **BREAKOUT SESSION 3**
- MODULE A** — Richard Milo  
**VAP Presentation**
- MODULE B** — Sandra MacMaster, RRT  
**Shiftwork Sleep Syndrome**
- MODULE C** — Sue Ness, RN, MHS/Joanne Young, RRT  
**RTs in Primary Care**  
The management of chronic illness is costing billions of Canadian health care dollars per year, and it is recognized that a more comprehensive approach to improve outcomes for this population is imperative. It is well documented that patient/family education, access to an inter disciplinary team, and self-management techniques are key strategies that empower patients to feel in control of their chronic condition(s). Reducing the frequency of exacerbations, minimizing distressing symptoms, and improving quality of life is both patient-focused and fiscally responsible. Access to appropriate resources and programming is also essential. This presentation will discuss NB's proactive approach to community-based care and focus specifically on the role of Registered Respiratory Therapists as case managers within NB's Extra-Mural Program.
- MODULE D** — Jeff Kobe, RRT  
**Anesthesia for Pediatric Bronchoscopy**
- 8:00 pm              **FUN NIGHT PUB CRAWL!**

### May 27, 2006 SATURDAY

- 7:30 – 8:30 am      **Poster and Paper Presentations Breakfast**
- 8:30 – 9:00 am      **Opening Remarks**
- 9:00 – 10:00 am    **Keynote Speaker: Dr. Robert Kacmarek, PhD, RRT, FCCM, FCCP**  
**Management of ARDS: Beyond the ARDSnet Protocol**  
Both animal and patient literature has clearly established the need to reduce peak airway pressure and limit tidal volume. However, the animal data clearly indicates the need to avoid opening and closing of unstable lung units. The question of how to properly accomplish this aspect of a lung protective ventilatory strategy is still open to debate. Recent literature demonstrates that the lung can be opened by the use of recruitment maneuvers and the benefit of these maneuvers can be sustained if a decremental PEEP trial is used to identify the PEEP level avoiding derecruitment. Various strategies of identifying the optimal PEEP level will be discussed.
- 10:00 – 11:00 am    **Keynote Speaker: Joe Lewarski, BS, RRT — Long Term Care of the Tracheostomy Patient**
- 11:00 – 12:30 pm    **Lunch with the Exhibitors**

# CSRT Educational Forum Preliminary Programme

12:30 – 1:30 pm

## BREAKOUT SESSION 1

**MODULE A** — Dr. Dennis Bowie — PFT

**MODULE B** — Joe Lewarski, BS, RRT — Standards in Home Care

**MODULE C** — Dr. Robert Kacamarek, PhD, RRT, FCCM, FCCP

### Clinical Recognition Program

Few institutions have set up programs designed to recognize and reward clinical staff for performing at a level beyond that is expected of the experienced clinician. At the Massachusetts General Hospital we have a multidisciplinary program to recognize these individuals. Specific attributes of staff at all levels of practice have been defined and criteria for movement up the recognition later have been developed. Staff being considered for advancement must present a portfolio to a multidisciplinary board. This portfolio must establish that the clinician has met all criteria for the advanced level. In addition, the clinician must participate in an interview conducted by three members of the board. We have found that this program has greatly benefited individual staff as well as the department and has improved collaboration at the bedside.

**MODULE D** — Ann Hudson Mason

### Benefits and application of NO

1:30 – 2:30 pm

## BREAKOUT SESSION 2

**MODULE A** — Paul Ouellet

### Sedation During Mechanical Ventillation

**MODULE B** — Dr. Rachel Morehouse — *Sponsored by Fisher and Paykel Healthcare Inc.*

### Life/Work Balance: Finding Enough Time For Sleep

**MODULE C** — Dr. Tom Evans

### Anesthesia Hemodynamics

**MODULE D**

### Critical Care

2:30 – 3:00 pm

## Refreshment Break, Exhibit Hall

3:30 – 5:30 pm

## CSRT ANNUAL GENERAL MEETING

### CSRT President's Awards and Banquet

6:00 pm

— Cocktails

6:30 pm

— Dinner

8:30 pm

— Keynote Speaker: Mr. Arthur Black

9:00 pm

— Dance with the band Boys Next Door

### Arthur Black — Keynote Address

The CSRT is pleased to announce that veteran CBC host Arthur Black will address delegates at the President's Banquet on May 27. For 19 years he hosted Basic Black, a national CBC radio program dedicated to wackiness. He currently hosts two television shows, *Weird Homes* (the winner of a Golden Globe and nominated for a Gemini) and *Weird Wheels*, both of which are self-explanatory. He also writes a weekly humour column syndicated in over 50 Canadian news papers and has authored eight books, including *Plaudits*, *Kudos* and *Huzzahs*. He has been awarded the Stephen Leacock Medal—Canada's highest award for humour, the National Magazine Award for Humour, an ACTRA "Nelly", Best Opinion/Commentary, Cadogan Award for Best Weekly Newspaper Column and Ohio State Award for Best Children's Series.

# CSRT Educational Forum Preliminary Programme

**May 28, 2006, SUNDAY**

- 8:30 – 9:30 am      **Continental Breakfast**
- 9:30 – 10:00 am    **Opening Remarks**
- 10:00 – 11:00 am   **Dr. Robert Kacmarek, PhD, RRT, FCCM, FCCP**  
**Ten Ways to Improve Your Success With NPPV**  
 The successful application of NPPV is dependent to a great extent on the capabilities of the clinician applying the technique. However, many institutions indicate limited success with NPPV. For this technique to be successfully applied the clinician must understand the indications, contraindications, and problems associated with NPPV. They must understand how to approach the patient to insure maximal success. They must know how to properly set the ventilator. They must understand the specific issues related to the individual ventilator used for NPPV. They must know how to select and fit a mask properly. They must know how to titrate O<sub>2</sub> into a bilevel pressure ventilator system. They must know how to deliver an aerosol treatment during NPPV. These individual factors can frequently be the difference between success and failure.
- 11:00 – 12:00 pm   **Panel Discussion — Canadian RT Influences in Global Respiratory Therapy**
- 12:00 – 12:30 pm   **Closing Remarks**

## Educators Conference Registration Form

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# Educational Forum Registration Form



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Join us Friday night for a tour of local uptown watering holes that will start out at the boardwalk... we'll sit waterside and watch the sun set. Then off on a three-block stroll to other favorite establishments that will likely have some live entertainment, including O'Leary's, a must stop, in a city that boasts one of Canada's largest Irish communities.

Come along for the whole tour or find your favorite spot and go no further... it's up to you!! We have local brewhouses or for the more sophisticated, a brand new Martini bar. Sign-up at at Grannans on the boardwalk (right beside the Trade and Convention Center) for 7:00 pm. Stay tuned to the CSRT website for details

## Banquet Band

Saturday, May 27, 2006

After dinner — get ready for a party! The President's Banquet will be a memorable night. Not only will we have CBC host Arthur Black as our keynote speaker, we will be kicking off our shoes and doing some dancing to the **Boys Next Door**.

Based out of Halifax, **Boys Next Door** is a high energy four-man Maritime Kitchen Party band. They feature folk rock, adult contemporary, several traditional favorites as well as a variety of original compositions. They start at 9:00 p.m. in the Marco Polo Room.

For a complete details — please refer to the CSRT website under Annual Meetings.

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\* Pre-registration deadline April 21, 2006

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Registration includes Exhibitors Breakfast, Sunday Continental Breakfast, two lunches and breaks, Wine and Cheese Reception, all lectures and workshops, entry to Exhibit Hall. GST is included in the total #119220010 RT

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## CSRT Partners with Primary Health Care

Governments across Canada are working to improve Primary Health Care — basic, everyday health care for every Canadian. Primary Health Care has the potential to keep waiting lists down, lessen the pressure on emergency rooms and make the system more sustainable.

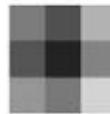
The CSRT is pleased to announce that it is a partner in the Primary Health Care campaign being undertaken by the National Primary Health Care Awareness Strategy. The goal of the campaign is to raise public awareness of primary health care, focusing on the issues of health care teams, information, access and healthy living.

The National Primary Health Care Awareness Strategy (NPHCAS) is a partnership of provinces, territories and Health Canada, with Saskatchewan Health as the administrative lead. The project is funded by Health Canada, under the national envelope of the Primary Health Care Transition Fund (PHCTF). The goal is to increase public awareness and understanding of primary health care (PHC) and its potential to enhance health outcomes, as well as increase the effectiveness and sustainability of health care in Canada.

It would be difficult to plan and execute an awareness campaign without first gauging the current level of awareness and understanding. So, although the NPHCAS is based on the assumption that few Canadians know about or understand PHC, the project partners set out to more clearly identify and quantify the knowledge and awareness levels early on.

Benchmark research to inform the campaign was undertaken and the results are on the project's web site. Among the things the partners learned is that there is a discrepancy between the number of people who say they've heard or seen the term

Primary Health Care



Soins de santé primaires

“primary health care” (60.5% of survey respondents) and the number who can describe it using even the broadest of terms (39.9% of survey respondents).

Armed with this research, and in dialogue with key stakeholders, the partnership developed and launched its campaign in September 2005, using the concept of four pillars, symbolized by four distinct colors, to illustrate PHC and help explain efforts going on across Canada to strengthen the PHC system. Blue represents a team approach, the gray represents information, the yellow represents access, and the pink represents healthy living. In the logo, these four blocks of colour overlap in the middle to form a cross, the traditional symbol for basic health care. In the same way, the four “building blocks” of PHC overlap and support the others, with the goal of improving the health of Canadians everywhere.

The pillars and the colours, are the basis of a strong visual identity repeated in the project's advertising, web site and promotional materials. Hopefully by now you have seen the campaign!

The ads are a key component of the awareness strategy, but they are far from being the only piece. A comprehensive partnership strategy, designed to associate PHC with high profile organizations and trusted health care providers like the respiratory therapists is helping get the message out at the grassroots level. In addition, public relations activities to support both the project and its member partners' activities are planned. As the campaign moves

forward, the project team will continue its dialogue with stakeholders to ensure it capitalizes on any opportunities for co-operation.

Check out the project's web site [www.primaryhealthcare.ca](http://www.primaryhealthcare.ca). It contains not only the research documents, but also information on the project and on PHC in general. You'll also find stories of PHC in action across Canada, a list of our partners and links to further resources. Put it in your bookmarks now — [www.primaryhealthcare.ca](http://www.primaryhealthcare.ca) — and visit often.

For more information:  
Karen Gibbons, Project Lead  
National Primary Health Care  
Awareness Strategy  
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Regina, SK S4S 6X6  
1.306.787.3224  
[nphcas@health.gov.sk.ca](mailto:nphcas@health.gov.sk.ca)

Or

Douglas Maynard  
CSRT Executive Director  
[dmaynard@csrt.com](mailto:dmaynard@csrt.com)  
1-800-267-3422

## CSRT Joins the Health Action Lobby

The CSRT's application for membership in the Health Action Lobby (HEAL) has been accepted with unanimous support.

HEAL was created in 1991 out of concern over the erosion of the federal government's role in supporting a national healthcare system. The lobby group is a coalition of national health and consumer associations and organizations dedicated to protecting and strengthening Canada's healthcare system. It represents more than half a million providers and consumers of healthcare.

Highly politicized, yet non-partisan, HEAL has brought forward many key recommendations regarding healthcare policy. The lobby group focuses on a variety of issues. These include questions related to creating a national strategy for health human resources planning (which includes working towards a healthier workplace for healthcare providers), the promotion of interdisciplinary collaboration within healthcare and pandemic preparedness.

HEAL has developed the following set of guiding principles.

### HEAL Guiding Principles for Health and Health Care

- Health and healthcare are valued by all Canadians.
- Health is broader than the provision of healthcare, embracing health promotion, disease prevention and the underlying determinants of health in the context of healthy public policy and healthy communities.
- Access to quality healthcare, irrespective of the individual's ability to pay, is a basic Canadian value based on the principle of social justice.
- Safeguarding the national healthcare system requires adherence to a common set of principles.
- Finite resources are available to

preserve and protect the health of Canadians and to fund the national health insurance system.

- Health Goals — National and provincial health goals are required. These are a prerequisite for the conceptual framework within which resource allocation for the continuum of health care can occur in a responsible and efficient manner.
- Continuum of Care — Changing health needs of individuals and society require a broad range of community and institutionally based services. An integrated continuum of care, providing coordinated access to a range of types and levels of services, should be the model for the Canadian health system. Administrative and financial arrangements should be designed accordingly.
- Shared Responsibility for Safeguarding Canada's Health System — Federal and provincial governments share a time-honoured responsibility for safeguarding the five basic principles underlying an interlocking set of provincially/territorially administered health insurance programs. These principles are:
  - Portability of benefits
  - Universality of population coverage
  - Access to required services
  - Comprehensive benefits
  - Public (non-profit) administration
- Consumer Participation in Healthcare Decision-Making — Healthcare consumers are partners in healthcare. As partners, they are involved in decision-making concerning their care, and are jointly responsible with healthcare providers for health promotion aimed at enhancing the health status of Canadians. It is imperative that health consumers share in policy planning and evaluation, self-help and mutual aid. The healthcare system should be

responsible to the needs of consumers.

- Individual Rights — While the basis of our healthcare system is community responsibility, individual rights and participation in the healthcare environment must be protected and promoted.
- Cooperation — Interdisciplinary, intersectoral, intergovernmental cooperative action is required to build consensus around solutions to problems affecting health and health care. Concerted collaborative action is required to address common challenges.
- Stability of Funding — Stability of funding is a prerequisite for the provision of quality health services, health planning, research and innovations that improve the effectiveness of care and care delivery.
- Efficient and Effective Management — To ensure the long-term availability of resources for the healthcare system, resources must be managed and allocated in an efficient and effective manner, and the system must provide incentives to do so.
- Voluntarism — Voluntarism and community involvement are important components of healthy public policy and healthy communities. The continued encouragement of facilitation of self-help and mutual aid efforts is essential.
- Professional Self-Regulation and Licensure — Public accountability is effectively discharged through rigorous self-regulation by health professionals. Public participation in self-regulation is valued by health professionals.

Douglas Maynard, Executive Director of the CSRT, states that participating in HEAL will benefit the CSRT membership mainly through its work in addressing healthcare human-resource issues. Participation

*Continued on page 33*

## Coroner's Case Study

Douglas Maynard RRT MBA, CSRT Executive Director

During the past year the CSRT received correspondence from the Office of the Chief Coroner in a Canadian city. The correspondence was regarding a death that was investigated by their office, which presents itself as an ideal learning opportunity for respiratory therapists.

The relevant details of the case are as follows:

A middle-aged man was brought to hospital after being found unresponsive. An RRT was paged to intubate the patient in Emergency when the patient's respiratory and neurological status deteriorated. Before intubating the patient, the RT inserted a #9.0 oral airway, pressure tested the Astar ventilator to ensure that it was operating properly and suctioned a large amount of yellow sputum from the oral pharynx. Following intubation with a #8.5 oral ETT, the RRT noted that the patient was easily ventilated with a resuscitation bag. The patient was then connected via the ETT to a ventilator. The mechanical airway from the patient to the ventilator consisted of the ETT, an ETT connector, a swivel elbow, a filter and a piece of corrugated tubing. The ventilator was set to volume control ventilation, which was changed to pressure control ventilation after the patient started to cough and fight the ventilator.

The decedent went on to develop increasing respiratory distress and sinus bradycardia, so the RRT disconnected the patient from the ventilator at the filter and reconnected the filter, swivel elbow, ETT connector and ETT to the resuscitation bag. However, the RRT was unable to expel any air from the bag. No problem was identified on pressure testing of the resuscitation bag (by itself and with the filter), passage of a suction catheter down the ETT revealed no obstruction and reinsertion of the laryngoscope confirmed proper

placement of the ETT between the vocal cords (confirmed by a second RRT). The resuscitation bag, filter, swivel elbow, ETT connector and ETT were reconnected, but the RRT was still unable to ventilate the patient. The patient's clinical condition continued to deteriorate and he died shortly thereafter despite resuscitative efforts.

After the patient was pronounced dead, the RRT observed a thin piece of plastic between the swivel elbow and the ETT connector, which had obstructed the patient's mechanical airway and prevented the patient from being ventilated. Apparently, a piece of the plastic bag in which the swivel elbow was packaged tore away when the swivel elbow was removed from it, and became caught on the end of the swivel elbow at its attachment to the ETT connector.

This case highlights a number of important issues. First, it clearly identifies a situation in which an RRT acted in a competent and professional manner, and the patient still had an unsuccessful outcome. A committee review of this case highlighted the fact that the RRT applied troubleshooting skills, sought assistance from colleagues for confirmation of ETT placement, clearly documented all relevant information and reported the problem to the appropriate individuals.

Second, this also demonstrates why it is very important that every health-care professional carry some type of errors and omissions or professional liability insurance. Despite the best efforts of a trained and diligent professional, a negative outcome is still possible.

Another issue that is raised by this case is that of the packaging of this type of equipment. The obstruction was caused by a piece of pliable, clear plastic packaging that likely

contained the swivel elbow that was used in the ventilator circuit. There is indication that this type of packaging poses the potential for this type of incident to reoccur. Letters have been written to the manufacturer suggesting that a less pliable, tear away type packaging be considered for this type of equipment.

If your institution uses similarly packaged equipment I encourage you to share the details of this case with your colleagues. It may serve as a reminder that RRTs must be diligent in all aspects of how patient care is provided, including the opening and disposal of packaging materials, particularly when you may be surrounded by distractions in a critical situation.

You may also wish to communicate this case to your current suppliers of this type of medical equipment, encourage them to review their practices and evaluate whether the use of this type of packaging is the safest way in which to provide this type of equipment.

Please remember to practice safe!!

# Abstracts

Original article: **General Thoracic**

## **A Randomized Clinical Trial of Lung Volume Reduction Surgery Versus Best Medical Care for Patients With Advanced Emphysema: A Two-Year Study From Canada**

John D. Miller, MD a , \* , Richard A. Malthaner, MD b , Charles H. Goldsmith, PhD a , Ronald Goeree, MS a , David Higgins, MDCM a , P. Gerard Cox, MB a , Lawrence Tan, MD c , Jeremy D. Road, MD d Canadian Lung Volume Reduction Surgery Study

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Presented at the Forty-first Annual Meeting of The Society of Thoracic Surgeons, Tampa, FL, Jan 24-26, 2005.

**Background:** We present a summary report evaluating the efficacy of lung volume reduction surgery (LVRS) in patients with advanced emphysema in the Canadian setting.

**Methods:** Quality of Life measures assessed the efficacy of adding LVRS to best medical care including rehabilitation in this blinded randomized multicentered controlled trial with 2 years of follow-up. Health utility and quality-adjusted life years (QALY) were outcomes central to our economic assessment.

**Results:** None of the 32 patients randomized to the LVRS arm or 30 patients in the best medical care (BMC) arm crossed-over and no patients were lost to follow-up. Overall surgical mortality was 16% at 2 years while the overall medical mortality was 13% ( $p = 0.914$ ). There were no 30-day postoperative deaths but 2 deaths (6%) occurred within 90 days of randomization. Surgery

reduced the residual volume measured at 6 months by 23% (5,385 mL to 4,322 mL,  $p = 0.007$ ). There was an increase in forced expiratory volume in 1 second (FEV1) of 30% (265 mL,  $p = 0.013$ ) from baseline, an improvement in the six minute walk test (6MWT) of 78 meters ( $p = 0.045$ ), and an increase in Health Utility Index 3 (HUI3) which peaked at 6 months with a difference of 0.16 ( $p = 0.129$ ). There was a gain in QALYs of 0.21 ( $p = 0.19$ ) in the LVRS-arm over the BMC-arm. The LVRS costs an additional \$28,119 Canadian dollars (CAD) compared with BMC or \$133,900/QALY gained.

**Conclusions:** The addition of LVRS to best medical care including pulmonary rehabilitation improves pulmonary function, exercise activity, and quality of life in selected patients with advanced emphysema. Cost is high but in keeping with other treatment modalities currently available.

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## **Nosocomial Respiratory Syncytial Virus Infection in Neonatal Units in the United Kingdom**

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A2 Thames Valley University London UK

Nosocomial Respiratory Syncytial Virus infections are frequently reported and tend to be more severe, because of comorbidity, such reports, however, are frequently from a single centre. The incidence and outcomes of nosocomial Respiratory Syncytial Virus infection in UK neonatal units over a five year period were estimated by interrogating the Capse Health Care Knowledge Systems database, which contains anonymised details of 55% of UK hospital admissions. A total of 79,642 admissions commenced on the infants date of birth and contained an ICD-10 code for low birth weight or immaturity. Thirty-seven of the 79,642 admissions also contained a Respiratory Syncytial Virus code. Two (5.4%) with Respiratory Syncytial Virus

and 2,736 (3.4%) without Respiratory Syncytial Virus died. Survivors with Respiratory Syncytial Virus codes experienced significantly increased length of stay. In the extreme immaturity subgroup the length of stay was 117.5 days with Respiratory Syncytial Virus and 51.3 days without Respiratory Syncytial Virus ( $p = 0.0002$ ). In the low birth weight or other preterm sub-group the length of stay with Respiratory Syncytial Virus was 69.2 and without Respiratory Syncytial Virus 14.7 days ( $p < 0.0001$ ). The observed low rate for nosocomial Respiratory Syncytial Virus (0.46/1000 admissions) should be regarded as a minimum. The increased length of stay in infants with Respiratory Syncytial Virus infection emphasises that units should have guidelines to prevent and deal with Respiratory Syncytial Virus outbreaks.

**Keywords:** Nosocomial Infection, Respiratory Syncytial Virus

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# The Application of the Principle of Informed Consent to the Profession of Respiratory Therapy

Patrick Litwin, RRT

## Abstract

Respiratory therapy is an allied health profession providing assistance in the diagnosis, treatment, and health promotion of patients with respiratory disorders. Informed consent is a process in which a patient learns key facts about a treatment or therapy, including potential risks and benefits, before deciding whether or not to have it. The principle of informed consent originates from the client's legal and ethical right of autonomy from the health care professional's ethical duties of beneficence and nonmaleficence. To date, the ethical issue of informed consent is not one that has been addressed to any detail within this profession. In this paper the author presents a commentary on the issues surrounding informed consent in the practice of respiratory therapy. He also outlines the basis for his opinion that in the alert, competent, and conscious patient, the therapist's duty to seek informed consent exists in most circumstances. The author also recommends the various provincial Respiratory Therapy regulatory bodies follow the lead of the College of Respiratory Therapists of Ontario and develop guidelines for their members to follow in understanding and applying the ethical principles involved in informed consent.

## Introduction

This paper presents a commentary and opinion on the issues surrounding informed consent in the practice of respiratory therapy and will examine how the principle of informed consent may be applied to the day to day practice of respiratory therapists. The discussion of this topic will be limited to considering only the alert, conscious patient admitted to outpatient clinics, home care or a surgical or medical care ward in an acute care hospital and not those in the trauma or operating room settings; nor those unconscious or incompetent to render consent.

## Background

Respiratory therapy is an allied health profession providing assistance in the diagnosis, treatment, and health promotion of patients with respiratory disorders. It had its beginning after the Second World War. The first incorporated body was in the state of Illinois in 1946 at the

University of Chicago.<sup>1</sup> In Canada, the profession officially came into being in 1964.<sup>2</sup>

Informed consent is a process in which a patient learns key facts about a treatment or therapy, including potential risks and benefits, before deciding whether or not to allow the treatment or therapy. It originates from the legal and ethical right of autonomy the client has to direct what happens to their body and from the ethical duty of beneficence and nonmaleficence that the health care professional has to choose in the best interests of the patient and to do no harm.<sup>3,4,9</sup> It is generally accepted that the process begins with information regarding the nature of the underlying medical condition and moves to a discussion of the proposed treatment or therapy and any reasonable alternatives, including any relevant risks, benefits, and uncertainties related to each of them. It should also include a discussion of any risks, benefits, and

uncertainties related to not pursuing any treatment or therapy at all.<sup>4</sup> Next, the process must also include an assessment of the information presented by the health care professional seeking the consent.<sup>5</sup> Finally, the process concludes with the acceptance by the client of the proposed treatment or therapy. However it must be recognized that the process of informed consent continues throughout the provision of the treatment or therapy and may be withdrawn by the patient at any time.<sup>6</sup>

The issue of informed consent is not one that has been addressed to any detail in the profession of respiratory therapy. A search of the Medline database was conducted using the following terms: informed consent, allied health occupations, allied health personnel, respiratory therapy. The Medline search returned only two references to this topic; one reference dealt with respiratory care research<sup>7</sup> and the other was a case report from England of an extremely premature infant with TB, apparently contracted from its mother.<sup>8</sup> The authors in this second reference report that the case raised several challenging issues, including some ethical ones, in their treatment of the infant. Neither article directly addresses the issue that is the topic of this discussion.

Of the profession's regulatory colleges in Canada, only the College of Respiratory Therapists of Ontario (CRTO) has produced a Professional Practice Guideline<sup>9</sup> to address the issue. This guideline is in response to the province of Ontario's Health Care Consent Act.<sup>10</sup>

**Discussion**

If it is an ethical minefield to address the issues of informed consent in the medical profession at large, it becomes even more so when attempting to delineate those principles when dealing with any of the allied health professions, respiratory therapy being only one of many. For practitioners who most often do not originate the treatment orders or write any prescriptions, the waters of informed consent are muddied by their role in carrying out what a physician, nurse practitioner or other medical professional has ordered. Changes to the modes of health care delivery further complicate this.

In examining the topic of informed consent in respiratory therapy, there are two ethical questions to be asked. First, does a duty to seek informed consent exist, given that respiratory therapists do not in most jurisdictions have the ability to prescribe therapies? Second, if the duty exists, and I believe it does, what are the limits of that duty?

In consideration of the first question, namely if a duty to seek informed consent exists, some have argued that it does not since the respiratory therapist's duty is to the physician to carry out their orders. This position is a hold over from the military framework that the medical profession evolved in in the last centuries and does not reflect the current state of health care. A new paradigm governs health professionals in our day and one of the key elements in this paradigm of professional conduct in health care delivery is an emphasis on critical thinking. Blind obedience to a physician's orders by any health professional is not tolerated and legal precedent has been established to back that up. As pointed out in an article by Gerald Winslow's entitled 'From Loyalty to Advocacy: A New Metaphor for Nursing', in at least one case a nurse was found guilty of manslaughter for following a physician's order without questioning it.<sup>11</sup> In addition, current codes of ethics and professional practice of several provincial colleges of respiratory

therapy<sup>12,13</sup> and the Canadian Society of Respiratory Therapists<sup>14</sup> state that the therapist is to be guided by concern for the welfare of the patient. The British Columbia Society of Respiratory Therapists (BCSRT) and the American Association for Respiratory Care (AARC) in the United States go further in actually delineating the duty of informed consent.<sup>15,16</sup> In the BCSRT Statement of Ethics and Professional Conduct it states that the respiratory therapist is to 'Respect and protect the legal and personal rights of patients they treat, including the right to informed consent and refusal of treatment'. The AARC statement is very similar. This places a different motivation for providing care other than simply carrying out 'what the doctor ordered'.

Some might suggest that because the patient has seen their physician and because that physician has ordered an assessment or therapy, the existence of a written order or prescription for the same equates to informed consent. This is a dangerous assumption; while in an ideal world, one might assume that the patient has discussed the proposed therapy with the prescribing physician, has had the opportunity to ask questions, and in the end has given their informed consent to the procedure, this may or may not be the case in reality. The first duty of the therapist should be to ask "What has your physician told you about your condition and 'blank' (the proposed treatment)?" The extent of the discussion by the physician may have been something to the effect of "I'm going to order some breathing tests for you" or "I want a respiratory therapist to assess you for home oxygen therapy." In a case such as this, the therapist must explain what the test or assessment entails and must obtain consent before beginning. If the patient has not had the opportunity to have their questions answered, the respiratory therapist must either be prepared to entertain those questions and answer them to the best of their knowledge and ability or refer the patient back to the prescribing physician. They must

also be prepared to go back to the prescribing physician should they believe, in their professional judgement, that the patient does not understand or withdraws their consent.

The foregoing position that because the patient has seen their physician and since that physician has ordered an assessment or therapy informed consent exists, also overlooks the nature of the fiduciary relationship between the respiratory therapist and the patient, and the patient's perceptions of health care delivery. Patients often may not distinguish between health care providers. To the ill, especially the elderly, any male who attends them is seen as a doctor and any female as a nurse. In addition, some patients were raised in a cultural milieu where their physician was never questioned; they were taught to simply follow the doctor's orders. They operate from a position of trust in whoever is attending them and follow whatever instructions they are given. Because of these factors, initiative is required on the part of the therapist to raise the issue of consent.

Further, more often than not, the respiratory therapist is part of an interdisciplinary team that is involved in patient care. In many cases, similar to nurses, the therapist is also in the position of a patient advocate. In this day and age with the exponential expansion of medical knowledge and a myriad of technological advances, often the respiratory therapist is in the best position to recommend a therapy as part of that team. Often the team discusses approaches and decides on a course of action, for a variety of reasons the patient may not be included in these discussions. As the originator of the care plan and as the health care professional who then goes out to initiate the care plan the team has endorsed, the respiratory therapist clearly has a duty to obtain the consent of the patient. This is in keeping with the CRTO guideline.<sup>9</sup> Additionally, many physicians who recognize the expertise of the respiratory therapist may simply write an

order for 'respiratory therapy to assess and treat'. One would not enter a patient's room and begin an assessment without first obtaining consent for it. Following the assessment the respiratory therapist would contact the primary physician with the findings of that assessment and recommendations for treatment. If the physician agrees and gives a verbal order to initiate therapy the duty to seek informed consent is clear, since in this scenario the physician has not obtained consent.

Another objection raised against placing a duty of obtaining consent on respiratory therapists is the view that this duty rests only with the prescribing physician as the gatekeeper. The flaw with this reasoning is that the model of healthcare delivery is changing and the physician may no longer be the gatekeeper. As legislation governing health professions evolves and interdisciplinary referral becomes not only possible, but also encouraged, it may not be the physician who refers the patient to a respiratory therapist for assessment. The duty to seek informed consent is clear, since in this scenario no physician has been involved nor obtained consent.

A further argument against the duty to seek informed consent by respiratory therapists is that consent is usually obtained upon admission to the facility or program and need not be sought again. This is similar to the preceding argument. In both the home care and the acute care setting the patient usually signs a consent form upon admission, this blanket consent is held to apply to any procedures and treatments that the patient may require. The blanket consent usually contains a statement that the patient is consenting to the diagnostic techniques and/or treatments ordered by their admitting physician. In the home care setting there is also often a clause stating the patient acknowledges that they have been given an explanation and advice by their physician and have been given the opportunity to ask questions of their physician. Does

this absolve the therapist of the duty to seek informed consent for what they are about to inflict upon the patient? I do not believe so. The fault with this view is that consent is viewed here as merely a piece of paper rather than a choice that may have to be reviewed. Again, some patients, by virtue of their culture, or demographic age group, may not feel it is appropriate to question their physician. The therapist still retains a duty to the patient to review the therapy before they begin it.

If one accepts the ethical position that the patient has the inherent right of self-determination, then that right must be respected at all stages of health care delivery, not merely at the front gate. At the very least there is a duty to obtain basic consent before a therapy or procedure is initiated, even if ordered by a physician. For example, before performing a radial artery puncture to obtain an arterial blood gas, the therapist should explain the procedure and obtain their consent before beginning.

Having established that the duty to seek informed consent from patients exists, to move forward and define the scope of the duty, several questions must be dealt with. When does the respiratory therapist have the duty to seek informed consent? I believe the duty always exists within the framework I defined at the beginning of this paper. That is, whenever a therapist is to assess or treat an alert, conscious patient admitted to an outpatient clinic, to a home care service, or to a surgical or medical care ward in an acute care hospital. Consent is a moment in time; informed consent is a real-time activity. The capacity of the patient may change; they may change their mind about their therapy positively or negatively. One must ask if the patient at the time of signing the consent form understood the procedure that they are about to be subjected to. Because locations of care delivery may change, from the emergency department to the ICU to a general ward to a hospice or home,

consent received at one location may no longer cover the procedures or therapies at another. Consent may have to be reviewed as the patient travels from one location to another in the progression of their therapy. Further, changes in the patient's condition may render them now incapable of giving consent, or vice versa. Medications may also interfere with the patient's capacity to give consent and must be considered. Since any consent given may also be withdrawn, it is important to reassess the situation at the time of therapy.

In recognition of this reality, the various codes of ethics, and the considerations that developed them, place a duty of care upon the respiratory therapist to evaluate any prescribed therapy, investigate the patient's understanding, and review that patient's consent before initiation of any given therapy. Having acknowledged the duty to critically evaluate physician orders and, in a sense, advocate for the welfare of the patient, respect for the patient's right of self determination in medical decisions must be regarded with the greatest care.

What about situations where the physician, alone, or in conjunction with the patient's family has decided it is not in the best interest of the patient to disclose some or all of the aspects of their condition to them? What is the therapist's duty? Are they excused from seeking informed consent for a given procedure? Is it possible to obtain informed consent in this situation? It must be recognised that there are multiple stakeholders in the process, the patient, their family, the physician, and other health care team members. The issues are complex and the final answers are beyond what can be discussed in detail here. Suffice it to say that I believe because the therapist has an ethical duty of beneficence and non-maleficence towards the patient, the therapist retains a duty to seek informed consent in the majority of circumstances. They are bound by their duty to the patient, and must

respect the patient's right of self-determination. That right should not be abridged, except in the gravest of circumstances. At the same time, they also must acknowledge that they are part of a health care team and must work collegially and cooperatively with other professionals. What if the therapist believes that the client should be informed? The therapist should communicate with the prescribing physician and other team members any misgivings about the approach and advocate for the patient.

**Conclusion**

In summary, I believe that a duty to seek informed consent before any assessment or initiation of therapy of the alert, competent, conscious patient in the outpatient clinic, acute or home care settings exists. Evolution, both of the profession of Respiratory Therapy and of the health care system, mandates that duty. Further, that duty is present in the majority of circumstances in the day-to-day practice of respiratory therapists. Consequently, I recommend that the various provincial Respiratory Therapy regulatory bodies follow the lead of the College of Respiratory Therapists of Ontario in developing guidelines for their members to follow in understanding and applying the ethical principles involved.

**References**

1. Weilacher RR. AARC — 50 Years of Service. [cited 2005 September 3]. Available at: [http://www.aarc.org/member\\_services/history.html](http://www.aarc.org/member_services/history.html)
2. The Canadian Society of Respiratory Therapists. About the CSRT. [cited 2005 September 3]. Available at: <http://www.csrt.com/about.php?display&en&2>
3. United Nations Educational, Scientific and Cultural Organization, Article 6 — Consent Universal Declaration on Bioethics and Human Rights, [cited 2005 October 28]. Available at: [http://portal.unesco.org/shs/en/file\\_download.php/b0f1e8f1dc4a4e8990faff370608cac2declaration.pdf](http://portal.unesco.org/shs/en/file_download.php/b0f1e8f1dc4a4e8990faff370608cac2declaration.pdf)
4. McMurray, L. Applying Principles of Informed Consent to Clinical Practice in Psychiatry, [cited 2005 October 28]

Available at: <http://www.cpa-apc.org/Publications/Archives/Bulletin/2002/october/mcmurray.pdf>

5. Pinker S. Am I my brother's keeper? Two perspectives on consent. *CMAJ*/July 24, 2001; 165 (2) 194-5
6. Informed Choice, College of Physicians and Surgeons of Alberta. [cited 2005 October 28] Available at: <http://www.cpsa.ab.ca/complaints/attachments/Informed%20Choice.doc>
7. Schwenzer KJ, Durbin CG. The spectrum of respiratory care research: prospective clinical research. *Respir Care* (2004 Oct) 49(10):1165-70
8. Katumba-Lunyanya J, Joss V, Latham P, Abbatuan C. Pulmonary tuberculosis and extreme prematurity. *Arch Dis Child Fetal Neonatal Ed* (2005 Mar) 90(2):F178-9; discussion F179-83
9. The College of Respiratory Therapists of Ontario. Professional Practice Guideline: Responsibilities Under Consent Legislation. July 1996 (reprinted September 2001) [cited 2005 September 3]. Available at: <http://www.crto.on.ca/pdf/ppg-resp-under-consent.pdf>
10. Government of Ontario. Health Care Consent Act, 1996, S.O. 1996, c. 2, Schedule A. Amended by: 1998, c. 26, s. 104; 2000, c. 9, ss. 31-48; 2002, c. 18, Sched. A, s. 10. [cited 2005 September 3]. Available at: [http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/96h02\\_e.doc](http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/96h02_e.doc)
11. Winslow GR. From Loyalty to Advocacy: A New Metaphor for Nursing. In Ethical Issues in Professional Life, Callahan JC, Editor. *Oxford University Press*; 1988. Page 99

12. The College and Association of Respiratory Therapists of Alberta. Code of Ethics [cited 2005 September 3]. Available at: <http://www.carta.ca/standards.htm#Ethics>
13. The College of Respiratory Therapists of Ontario. Standards of Professional Conduct August 1999. [cited 2005 September 3]. Available at: <http://www.crto.on.ca/html/stande.htm#profaccount>
14. CSRT Board of Directors, The Canadian Society of Respiratory Therapists. Code of Ethics March 2005. [cited 2005 September 3]. Available at: <http://www.csrt.com/about.php?display&en&7>
15. The British Columbia Society of Respiratory Therapists. Statement of Ethics and Professional Conduct. McComber DJ, editor. February, 2000. [cited 2005 September 3]. Available at: <http://www.bcsrt.com/pdf/standards.pdf>
16. American Association for Respiratory Care. AARC Statement of Ethics and Professional Conduct. Effective December 1994, Revised March 2000. [cited 2005 September 3]. Available at: [http://www.aarc.org/resources/position\\_statements/ethics.html](http://www.aarc.org/resources/position_statements/ethics.html)

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**CSRT Joins the Health Action Lobby**

*Continued from page 27*

in a group where many of our healthcare professional association colleagues are represented, allows us to ensure the needs of respiratory therapists are included in lobbying efforts regarding health human resources and other issues. Examples of HEAL's recent areas of focus include efforts to enhance interdisciplinary collaboration and national health human resource planning.

HEAL's membership is comprised of a long list of notable associations. HEAL's publications and media releases along with a list of HEAL's membership can be found at both [www.cchse.org/HEAL/](http://www.cchse.org/HEAL/) and [www.physiotherapy.ca/HEAL/english/index.htm](http://www.physiotherapy.ca/HEAL/english/index.htm).

For additional information on the CSRT's involvement with HEAL, please contact Douglas Maynard, Executive Director of the CSRT ([dmaynard@csrt.com](mailto:dmaynard@csrt.com), 1 800 267-3422).

# Estimating Peak Inspiratory Pressure to Compensate for Endotracheal Tube Length at Neonatal Ventilation Settings in SIMV

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## Abstract

**Introduction:** Endotracheal tubes are shortened to various lengths to prevent tube obstruction (kinking). The degree of this remaining length in the ET tube contributes increased resistance and dead space in the mechanical ventilatory circuit. Knowing ET tube resistance, at laminar flow, is inversely related to the fourth power of the radius (Poiseuille's Law) of the tube and proportional to length, additional work of breathing is created at different tube lengths. Neonates are at high risk for lobar atelectasis and congenital lung abnormalities, which reduce the lung available for gas exchange and if not acutely compensated for, can cause significant barotrauma to the remaining, intact lung. Yet, the relation of these variables and their clinical impact has not yet been mathematically defined.

**Hypothesis:** For neonates with small ET tube diameters, there is a linear mathematical relationship between ET tube length and the positive inspiratory pressure (PIP) required to sustain tidal volume. These relationships can be derived graphically and are described by the equation for a line:  $y = mx + b$ . (where  $m$  equals the slope of a linear plot of positive inspiratory pressure versus ET length and  $b$  is set to the positive end expiratory pressure). There also exists a linear relationship between the lobar volume lost which can be described by the same equation on a graph of tidal volume vs. percentage of isolated atelectasis.

**Methods:** Four endotracheal tubes ranging from 2.5mm to 4.0mm in diameter were shortened at one centimeter intervals and the pressure required by a mechanical ventilator in a pressure regulated, volume control mode (with a positive end expiratory pressure of 5ml H<sub>2</sub>O and without pressure support) to generate a tidal volume of 10ml was monitored in a synthetic, pre-formed plastic respiratory test lung with normal lung compliance (Cd<sub>2</sub>O/Cd of 0.94). Successive measurements at each tube length were sampled in each of three combined trials, the average of which used for calculations. Lobar parenchymal lung losses were simulated by external compression of the compliant lung model using a 3.0 mm tube at 8cm using ventilatory settings of PIP 15, PEEP 5. Tidal volume measurements were made using the calibrated Pneumotac of a VIP GOLD ventilator (ViaSys, California, USA)

**Results:** For endotracheal tubes of 2.5mm, a graphical linear relationship between tube length and pressure was observed using the least squares method as described by the equation:  $PIP = 0.67 \text{ ETL} + \text{PEEP}$  (Positive Inspiratory Pressure equals 0.67 multiplied by Endotracheal Tube Length plus Positive End Expiratory Pressure)

For ET tubes of 3.0 mm the equation described was:  $PIP = 0.5 \text{ ETL} = \text{PEEP}$  (Positive Inspiratory Pressure equals 0.5 multiplied by Endotracheal Tube Length plus Positive End Expiratory Pressure)

For patients with lobar lung loss due to congenital malformation or atelectasis:  $\text{Tidal Volume Lost} = 0.04 \text{ (Percentage of lobar loss)} + \text{Tidal Volume Measured at PEEP}$  (3.5 cm<sup>3</sup> in this model)

**Conclusions:** For neonatal infants with ET tubes of small diameters but with acceptable lung compliance, small increases in pressure may be needed to overcome intrinsic resistance of the ET tube and deliver adequate tidal volume. Further studies are needed to observe if these changes are clinically significant or are maintained in a poorly compliant lung model.

## Introduction

Mechanically ventilated patients demonstrate increased resistance to air flow in the respiratory circuit.<sup>1-3</sup> This resistance is greater than that of the normal upper airway, thus imposing significant work of breathing in both inspiration and expiration.<sup>4,5</sup> The degree of this resistance has been shown to vary with ET internal diameter, length and to be less affected by ventilator rate.<sup>5-10</sup> Several mechanical ventilators have developed functions to compensate for this increased resistance with moderate efficacy at alleviating the work of breathing.<sup>11,12</sup>

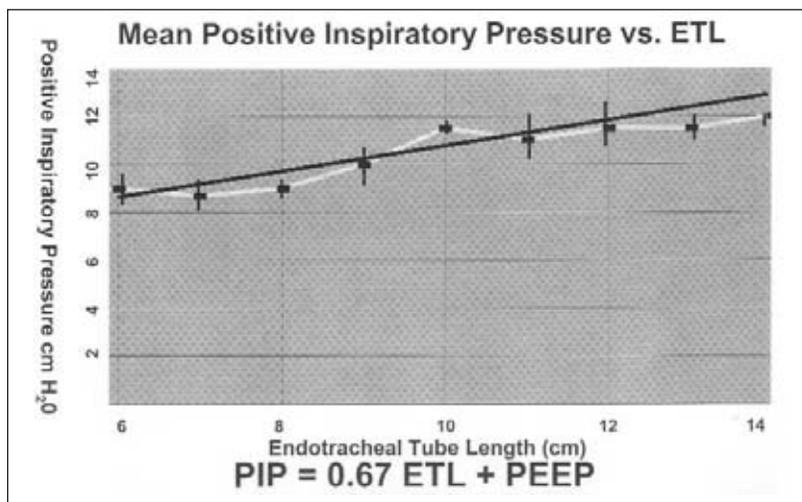
Understanding the effects of ET tube diameter and length on the respiratory dynamics of the patient is critical for effectively weaning patients toward extubation. To predict successful extubation patients are commonly placed on pressure support settings aimed at overcoming the resistance supplied by the ET tube itself. However a large range of pressure support values (from 4cm H<sub>2</sub>O to 15 cm H<sub>2</sub>O) have been reported to effectively compensate for ET tube size.<sup>13,14</sup> Yet to date, the length of the ET tube has not been accounted for in deciding upon which pressure settings in this 4 cm H<sub>2</sub>O to 15 cm H<sub>2</sub>O range are ideal.

The aim of the study was to determine the pressure adjustments needed at various ET tube lengths to maintain adequate tidal volume (V<sub>t</sub>) and to determine if such compensation maybe mathematically defined in a laboratory lung model for tidal volumes suitable for neonatal infants (roughly 10 cm<sup>3</sup>). Using the same model, we sought to determine the tidal volume "lost" as a factor of the size of lobar collapse.

### Lung Compliance

1. ET tubes, at diameters of 2.5 and 3.0 impart significant increases in work of breathing for neonatal patients
2. The length of the ET (where it is cut) for these tubes should be an the shortest possible length
3. For longer lengths, adjustments to PIP can be made to compensate for these changes.

**Figure 1.** Graphical relationship of Mean Positive Inspiratory Pressure and ET tube length for a 2.5 mm tube denotes a line with a coefficient relating pressure to length of 0.67 cm H<sub>2</sub>O/cm. This defines an equation for a 2.5mm tube of  $PIP = 0.67 (ET \text{ length cm}) + PEEP$ .



### Methods

#### Model Lung and Ventilator Settings

The synthetic, pre-formed plastic respiratory test lung used was a “bellows-in-a-box” lung model (IngMar Medical, Pittsburgh, PA) described in detail elsewhere with fixed compliance ( $Cd_20/Cd = 0.94$ ).<sup>6,15</sup> Briefly, a pair of bellows are set against a measured metal base with volume calibrations. The bellows are connected via plastic tubing measuring a total of 3 cm (1 cm from each lung simulating bronchi and a common tube of 2 cm simulating the trachea). Each connection of tubing is connected via a two-way valve. Four ET tubes (Portex Inc., Keene, NH) of diameters 2.5 mm, 3.0 mm 3.5 mm and 4.0 mm were each sequentially shortened at 1 cm intervals from 14 cm to 6 cm for determinations of

positive inspiratory pressure. The test ET tube was connected to a Servo I mechanical ventilator (Marquet Corp., Stockholm, Sweden) in a Pressure-Regulated mode with Vt set at 10 ml (which is considered standard tidal volume for a 1400–2000 gram infant). Ten measurements of pressure (measured to the nearest tenth) were made at each length for each tube studied, the mean of which was used for calculations. Positive end expiratory pressure (PEEP) was set at 5cm H<sub>2</sub>O and flow was held constant at 10 L/min (the standard flow rate used for premature infants in our unit) using the “Flow Lock” mechanism which holds flow constant for at least 90% of the inspiratory cycle of the volume-controlled breath. Pressure support and tube compensation functions on the ventilator were inacti-

vated and a rate of 20 breaths per minute was used in the trials. Inspiratory time was held constant at 0.35 seconds. Under water seal apparatus was used to ensure no air leaks were present in the ventilatory circuit prior to data collection.

#### Lobar Loss Calibrations

For the second experiment, A 3.0 mm endotracheal (ET) tube (Portex Inc., Keene, NH) at 8 cm was stabilized on the test lung. Underwater seal apparatus was again used to ensure no air leaks were present in the ventilatory circuit prior to data collection.

The test lung was now connected to a VIP GOLD ventilator (Viasys, California, USA) with a pneumotac connected at the tip of the ET tube and was calibrated by measuring tidal volumes administered at a positive end expiratory pressure (PEEP) of 5 cm H<sub>2</sub>O. Flow was held constant at 10 liters per minute. The ventilator was then converted to a synchronous intermittent minute ventilation mode without pressure support with a PIP of 15 cm and a PEEP of 5 cm. Baseline measurements were obtained. Lobar atelectasis was simulated by external compression of the bellows to a percentage of the overall lung field as determined by the measured metal base of the test lung. Volume measurements were recorded to the nearest tenth of a milliliter at 25%, 50% and 75% of this lung volume, the difference of these measurements from baseline values was used to calculate “lost tidal volume.” Ten measurements were made at each percentage of lung-volume loss and at baseline, the average of which was used for calculations.

#### Data Analysis

Results of the trials were entered into a computerized spreadsheet (Microsoft Inc., Redmond, WA) and graphed. The best fit line of the resulting data was used to calculate the slope by least squares method. PEEP was set at the y-intercept of the graph at 5 cm H<sub>2</sub>O.

**Results**

*Relationship Between PIP and Tube Length in a 2.5 mm ET Tube*

There was a linear relationship between PIP and increasing tube length as depicted in Figure 1. For a range of ET tube lengths between 6 cm to 14 cm, a slope of 0.67 cm H<sub>2</sub>O/cm increment in ET tube length was observed. The peak inspiratory pressure ranged from 8.7 cm H<sub>2</sub>O at 7 cm to 12 cm H<sub>2</sub>O at 14cm long ET tube. Mean PIP in this range was 10.4 cm H<sub>2</sub>O, similar to the median value of 11 cm H<sub>2</sub>O.

The mathematical equation for the above variables can be defined by the line:

$$y = 0.67x + 5 \text{ or } PIP = (0.67) (\text{ET length}) + PEEP.$$

*Relationship Between PIP and Tube Length in a 3.0 mm ET Tube*

There was a linear relationship between PIP and increasing tube length as depicted in Figure 2. For a range of ET tube length between 6 cm to 14 cm, a slope of 0.5 cm H<sub>2</sub>O/cm increment in ET tube length was observed. The peak inspiratory pressure ranged from 9 cm H<sub>2</sub>O at 6 cm to 12 cm H<sub>2</sub>O at 14 cm long ET tube. Mean PIP in this range was 10.6 cm H<sub>2</sub>O, similar to the median value of 10.9 cm H<sub>2</sub>O.

The mathematical equation for the above variables can be defined by the line:

$$y = 0.5x + 5 \text{ or } PIP = (0.5) (\text{ET length}) + PEEP.$$

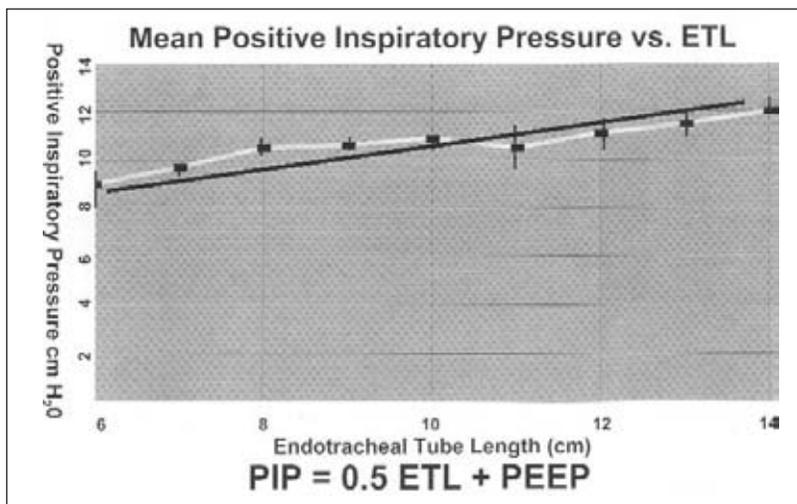
*Relationship between PIP and tube length in a 3.5 and 4mm ET tube*

Figure 3a and 3b demonstrate the relationship of mean PIP versus ET tube length for the larger (3.5mm and 4.0mm) tubes. At these diameters, there was no change in pressure observed at various ET tube lengths. For the noted range of 6cm to 14cm, the slope of the line for a sustained V<sub>t</sub> of 10cm<sup>3</sup> was zero for both the 3.5mm and 4.0mm sizes.

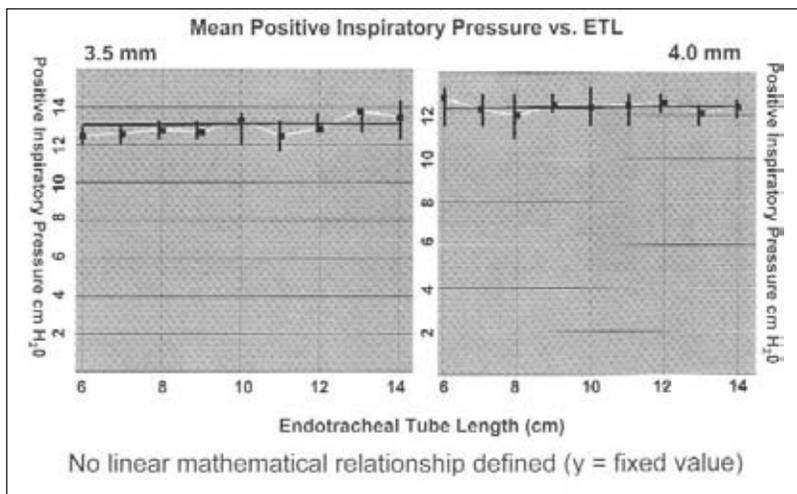
*Lobar Loss Simulation*

The range of lost tidal volumes compared with percentage of lobar loss in one lung are outlined in Table 1.

**Figure 2.** Graphical relationship of Mean Positive Inspiratory Pressure and ET tube length for a 3.0 mm tube denotes a line with a coefficient relating pressure to length of 0.5 cm H<sub>2</sub>O/cm. This defines an equation for a 3.0mm tube of PIP = 0.5 (ET length cm) + PEEP.



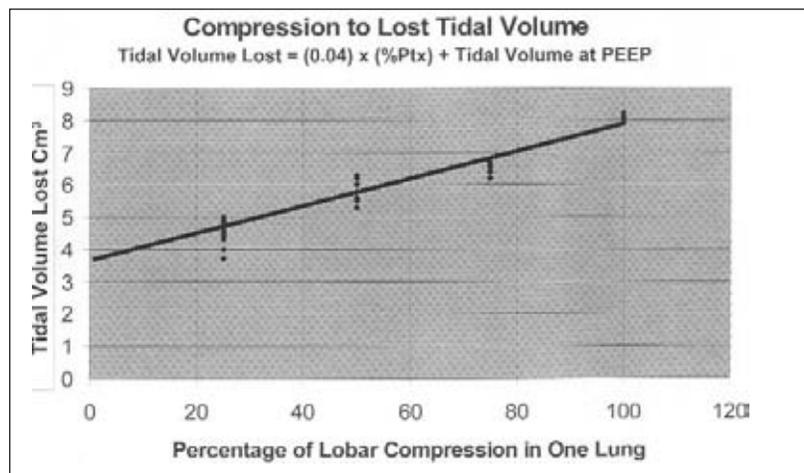
**Figure 3a and b.** Graphical relationship of Mean Positive Inspiratory Pressure and ET tube length for 3.5 mm and 4.0 mm tube denotes a line with a coefficient relating pressure to length of 0 cm H<sub>2</sub>O/cm.



For 25% compression, the lung model demonstrated a range of 3.7 cm<sup>3</sup> to 5 cm<sup>3</sup> volume lost, a distribution of 1.3cm<sup>3</sup>. At 50%, the range was between 5.3cm<sup>3</sup> and 6.3cm<sup>3</sup>, a difference of 1 cm<sup>3</sup>. At 75% of total lung volume, lost tidal volume ranged from 6.2 cm<sup>3</sup> to 6.7cm<sup>3</sup>, a difference of 0.5 cm<sup>3</sup>. With 100% compression of one lung, the tidal volume lost in the respiratory circuit ranged from 8 cm<sup>3</sup> to 8.2 cm<sup>3</sup>

a difference of 0.2cm<sup>3</sup>. The results of lost tidal volume as compared with percentage of lobar loss are depicted in Figure 4. For a range of 25% to 100% external compression of one lung, lost tidal volume ranged from 3.5 cm<sup>3</sup> to 8 cm<sup>3</sup> in a linearly distributed fashion. The slope of the calculated line by least squares method is 0.04. Hence the equation of the experimental line is  $y = 0.04x + b$ . Substituting the graphical axes for the formula of this

**Figure 4.** Graphical Representation of the Relationship between Lost Tidal volume and Positive Inspiratory Pressure. The coefficient defined by the equation of this line is 0.4.



line derives the following equation:  
 Lost tidal Volume = 0.04 (Percentage of  
 Volume loss in one lung) + Tidal Volume  
 measure at PEEP.

**Discussion**

Understanding the extent to which ET tube length and diameter contribute to resistance, pressure and work of breathing imposed on the neonate is critical for ideally weaning infants from mechanical ventilation. The effect of varying the size and length of standard neonatal endotracheal tubes on delivered tidal volume and PIP has not been effectively studied in any test model. If the prescribed pressure is too low, air will be lost in the conducting zone system, contributing to atelectasis and poor gas exchange. Overestimation of this pressure conversely leads to barotraumas and increased risk of air leak syndromes and pneumothorax.

For smaller size ET tubes (sizes 2.5 mm and 3.0 mm), ET tube length provides a significant contribution to the overall resistance of the ventilatory circuit. In a compliant in vitro lab model, the amount of pressure required to generate a Vt of 10 ml can be estimated using coefficients specific to each ET tube size and can be expressed by the following formula:

2.5mm tube: PIP = (0.67) (ET length in cm) + PEEP

3.0mm tube: PIP = (0.5) (ET length in cm) + PEEP

At larger ET tube sizes, the contribution of length to the cumulative resistance, and thereby pressure is most likely far outweighed by the increased internal diameter of the tube. Thus ET tube lengths at the 3.5 mm and 4.0 mm sizes is not a major factor in consideration of prescribing ideal PIP to overcome the increased resistance in our test model.

Atelectasis and lobar collapse are frequently encountered problems encountered in neonatal ventilation. As non-dependent regions of the lung are more susceptible to barotrauma, the remaining intact lung suffers from inflammation, decreased ventilation-perfusion mismatch, decreased lung compliance due to increased resistive forces - the hallmarks of respiratory distress syndrome.<sup>15</sup> If pressure adjustments are not made acutely after lobar, the remaining parenchyma is exposed to a positive inspiratory pressure required to inflate both dependent and non-dependent regions of the lung, which at the small tidal volumes required of infants, may lead to barotrauma with resulting alveolar rupture.

Knowledge of the extent of decreased tidal volume may allow

for pressure adjustments to be made in SIMV mode ventilation, thereby reducing barotrauma.

Such an equation could be of clinical utility in determining how best to modify pressures in small infants who experience loss of lung volume due to pneumothorax, congenital abnormality.

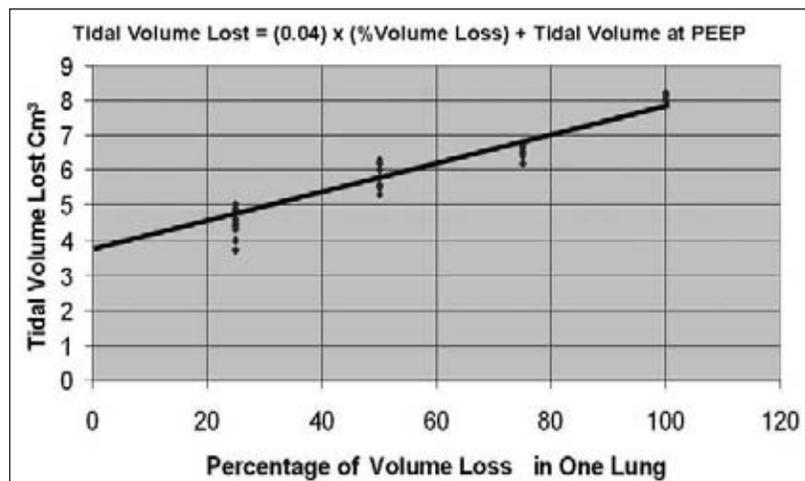
*Theoretical Implications Based on ET tube Size and Length*

The effects of length of the ET tube to determine an ideal PIP is seen in an example of a 1400 gram infant. To increase the probability of successful extubation, the infant is placed on assist-control ventilation with zero rate, dialing in enough PIP only to overcome the requirements of the ET tube. This is done in hopes of simulating physiologic work of breathing equivalent to only that provided by the upper airway. Based on the formula for a 3.0 mm tube, an infant with 6 cm of ET tube length would require 8 cm H<sub>2</sub>O while if the tube were uncut at 12 cm, he would require 11 cm H<sub>2</sub>O. As noted, neither over or under estimation of this pressure is optimal for the infant, contributing to atelectasis or barotrauma and decreasing the risk of successful extubation.

*Theoretical Implications of External Compression Equation*

The effects of pressure compensation on the neonatal lung is seen in an example of a 1400 gram infant who could be stabilized on the ventilator settings similar to those used in the experimental scenario and titrated to a tidal volume of 9.8 cc (7 cc/kg). If the infant has concomitant lobar loss from pneumonia, atelectasis or congenital lung anomaly consisting of 50% of lung volume by chest radiograph, his effective lost tidal volume would be, according to the derived equation, equal to 5.5 cm.<sup>3</sup> Hence until correction of the loss can be achieved, the infant's effective tidal volume is only 4.3 cm.<sup>3</sup> Failure to adjust the PIP in this scenario may overventilate the remaining lung.

**Table 1.** Relationship of simulated volume loss to lost tidal volume.



**Limitations**

This in vitro study used a laboratory test lung in a near-ideal respiratory circuit. Our results suggest adjustments in pressure may be needed to achieve adequate tidal volume-based ventilation in infants who experience an air leak. Further studies are needed to determine the utility of these equations in the clinical setting. Our lung compliance was very high, and infants with respiratory distress syndrome demonstrate poor lung compliance which can change over time and with the administration of surfactant. Furthermore, for test purposes, the Vt was set at 10 cm<sup>3</sup> which based on accepted standards of 5–7 cc/kg for estimations of tidal volume would be ideal for a 1400–2000 gram infant. Such infants would likely not be intubated with a size 2.5 mm tube without demonstrating significant air loss at the tracheal level.

Furthermore, as the percentage of lobar loss in our model increased, the standard deviation and distribution decreased, indicating the model may be more precise and internally consistent at higher percentages of volume loss.

Our results suggest a formula to estimate these tidal volume losses and prevent overventilation in neonates. Further studies are needed in animal models to determine clinical efficacy.

**References**

1. Pelosi P, Cereda M, Foti G, Giancomini M, Pesenti A. Alterations of lung and chest wall mechanics in patients with acute lung injury: effects of positive end-expiratory pressure. *Am J Respir Crit Care Med* 1995, 152:531-537.
2. Pesenti A, Pelosi, Rossi N, Virtuani A, Brazzi L, Rossi A. The effects of positive end-expiratory pressure on respiratory resistance in patients with the adults respiratory distress syndrome and in normal anesthetized subjects. *Am Rev Respir Dis* 1991, 144:101-107.
3. Mols G, Kessler V, Benzing A, Lichtwarck-Aschoff M, Geiger K, Guttman J. Is pulmonary resistance constant, within the range of tidal volume ventilation, in patients with ARDS? *Br J Anaesth* 2001, 86:176-182.
4. Kolobow T, Berra L, DeMarchi L, Aly H. Ultrathin-wall, two stage, twin endotracheal tube: A tracheal tube with minimal resistance and minimal dead space for use in newborn and infant patients. *Pediatr Crit Care Med* 2004 5:379-383.
5. Straus C, Louis B, Isabey D, Lemaire F, Harf A, Brochard L. Comparison of the endotracheal tube and the upper airway to breathing workload. *Am J Respir Crit Care Med* 1998, 157: 23-30.
6. Farstad T, Bratlid D. Effects of endotracheal tube size and ventilator settings on the mechanics of a test system during intermittent flow ventilation. *Pediatric Pulmonology* 1991, 11(1):15-21
7. Fiastro J, Habib M, Quan S. Pressure support compensation for inspiratory work due to endotracheal tubes and demand continuous positive airway pressure. *Chest* 1988 Mar. 93 (3)499-505.

8. Manczur T, Greenough A, Nicholson G, Rafferty G. Resistance of pediatric and neonatal endotracheal tubes: influence of flow rate, size and shape. *Crit Care Med* 2000 May;28(5):1595-8.
9. Wall M. Infant Endotracheal tube resistance: effects of changing length, diameter and gas density. *Crit. Care Med* 1980 8(1): 38-40.
10. Perez Fonan J, Heldt G, Gregory G. Resistance and inertia of endotracheal tubes used in infants during periodic flow. *Crit Care Med.* 1985 13(12) 1052-5.
11. Maeda Y, Fujino Y, Uchiyama A, Taenaka N, Mashino T, Nishimura N. Does the tube-compensation function of two modern ventilators provide effective work of breathing relief? *Crit Care Med.* 2003 7(5) 92-97.
12. Elsasser S, Guttman J, Stocker R, Mols G, Priebe H, Habertur C. Accuracy of automatic tube compensation in new-generation mechanical ventilators. *Crit. Care Med.* 2003 31(11) 2619-26.
13. Fabry B, Habertur C, Zappe D, Guttman J, Kuhlen R, Stocker R. Breathing pattern and additional work of breathing in spontaneously breathing patients with different ventilatory demand during inspiratory pressure support and automatic tube compensation. *Intensive Care Med* 1997 23:545-552.
14. Akeuchi M, Imanaka H, Miyano H, Kumon K, Nishimura M. Effect of patient-triggered ventilation on respiratory workload in infants after cardiac surgery. *Anesthesiology* 2000, 93: 1238-1244.
15. Gattinoni L, Pesenti A, Avalli-Rossi, F et al. Pressure Volume Curve of Total Respiratory System in Acute Respiratory Failure: Computed Tomographic Scan Study. *Am. Rev. Respir. Disease.* 1987; 136:730-736.
16. Fujino Y, Uchiyama A, Mashimo T, Nishimura M. Spontaneously breathing lung model comparison of work of breathing between automatic tube compensation and pressure support. *Respir Care* 2003 48:38-45.

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# Asthma Education: Principles and Practice

By Ian Mitchell, MD, FRCP(C) and Gaynor Govias, B Sc, B Ed, CAI.

Mitchell and Govias who co-authored the text *Asthma Education: Principles and Practice*, have provided asthma educators with an extremely well written, thoroughly detailed guide that addresses a number of topics from both a medical as well as an educator's perspective.

The intent of this review is to critique the applicability and relevance of this American-based text to the Canadian Asthma Educator's agenda in terms of its readability, user friendliness and ease of implementation. This all encompassing text consists of three sections, 14 chapters and is just under 500 pages in length including references and index.

The first section, (chapters 1–7), reviews the basic fundamentals of asthma including; physiology of the lung, pathophysiology of asthma, disease presentation, differential diagnosis, pulmonary function tests, triggers, medications and devices. This section also addresses “special situations” in asthma, such as pregnancy, occupational asthma and anesthesia to name but a few. The importance of recognizing comorbidities and the impact these can have on asthma control as well as a patient's ability to learn are discussed.

In Section 2, (chapters 8–11), the strategy is to define the role of education. Its emphasis is on the importance of taking a collaborative, integrated approach between the primary care physician, asthma educator and the patient, arguing that this approach tends to be the most effective in achieving disease control. Establishing the patient's needs must first be determined before the education process can begin.

Chapter 8 provides a virtual step-by-step pathway on how one can effectively map out the patient's initial and follow-up visits. This can prove to be a very effective tool for

those who are considering developing an asthma education program, ensuring the focal point always remains on the patients needs.

Adherence “...which involves much more than following a prescription for medication given by a physician” (Mitchell & Govias, pg. 268) is the scope of Chapter 9. This chapter is one of the most important and useful in the text for both new educators and for those who have been working in the field for a period of time. It is a superbly detailed review of what adherence and non-adherence is. Time is spent outlining common issues associated with each entity and providing general approaches to the adherence phenomenon.

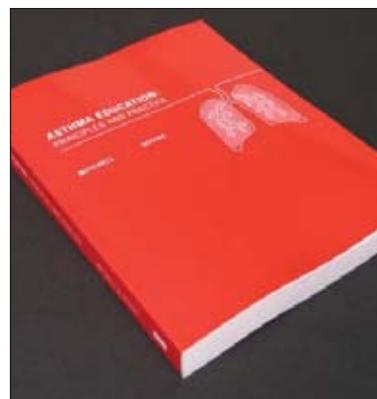
The result of successful teaching or educating is learning. This idea is fostered by a number of principles and is the essence of Section 3. Effective asthma educators must be able to adapt and change their teaching styles based of each patient's needs and learning styles. This section is highly condensed, reviewing numerous models and theories that are incorporated into all CNAC approved asthma educator programs.

## Overall Rating: 4 out of 5 Very Good

Who needs this text: In light of its depth and diversity, all health care professionals involved in asthma education could benefit from this text.

### Strengths

- Chapters are independent of each other therefore, the book does not need to be read cover to cover; can be used as a reference guide.
- Clearly outlines definitive objectives for each chapter
- Case studies throughout each chapter



- Chapter on “frequently asked” questions briefly addresses realistic encounters an educator may be faced with

### Weaknesses

- The most apparent weakness in this text is chapter 6 “Asthma Management and the Use Of Medication”. This text is American based, therefore the names and dosages of some of the medications are not the same as in Canada (i.e. Flovent 44 ug per puff whereas in Canada it is 50 ug, Albuterol, is called Salbutamol in Canada).
- Most of the governing and regulating bodies referenced are of US domain. This, in combination with the differences in dosing, could prove to be difficult to relate back to the Canadian educator.
- A typing error must also be noted on page 208 in figure 7–10. It states 48 puffs of Albuterol can be given every 20 minutes for 3 doses when treating an asthma exacerbation. The reader can only assume this should read 4–8 puffs of Albuterol, not 48 puffs.

For information on how to order this publication: Please phone 1-888-ASTHMA6 (278-4626).