

4th Annual Caritas Research Day

Thursday, January 31st, 2008
8:00 am to 4:00 pm
Grey Nuns Community Hospital - Auditorium

Speakers and poster presentations
on a wide variety of research projects

For more information and to register, please email Mary-Ann Clarkes at caritasresearch@cha.ab.ca or call 735-2274

Mousseau Memorial Lecture

presented by

Dr. Gerald T. Gau

Director, Cardiac Rehabilitation Program, Mayo Clinic

Presenters will highlight multi-disciplinary research initiatives relative to Chronic Disease Management. Areas of concentration include Cardiology, Diabetes, Stroke, Nutrition, Pulmonary, Renal Rehabilitation, ALS, Multiple Sclerosis, and Wound Management.

Research Corner

The Caritas Research Centre has moved and is now located in the Misericordia Community Hospital Administration Suite, 1W-33. All other contact information, including telephone and fax numbers, remain the same.

Caritas Research Centre

Room 1W-33
Misericordia Community Hospital
16940-87 Avenue, Edmonton, AB T5R 4H5
Email: caritasresearch@cha.ab.ca
Phone: 780-735-2274 Fax: 780-735-2674
<http://www.caritas.ab.ca/home/research/default.htm>

Caritas Health Group is now a member of "Research Canada An Alliance for Health Discovery"! Research Canada's mission is to: "...help Canadians maintain and improve their health by ensuring Canada is a world leader in health research". This non-profit volunteer group is a strong advocate for health research in Canada. For further information you can visit the Research Canada website at: <http://www.rc-rc.ca/en/index.php>

The 4th annual "Caritas Research Day" will take place at the Grey Nun's Community Hospital Auditorium on January 31st, 2008. This year's Speakers will be presenting current and multi-disciplinary research focusing on Chronic Disease Management. A concurrent presentation schedule allows for a choice of three different presentations within each time block, giving participants a variety of options to suit their own personal interests. A new addition to this year's events will include a panel discussion/question period to be held at the end of the day, and involving several distinguished physicians. As in previous years, poster presentations demonstrating the latest research will be featured.

This event is free and open to all those interested in research. Refreshments, including lunch, will be provided. Please mark your calendar and RSVP to Mary-Ann Clarkes to confirm your attendance.

Further information will be available on both the internet [<http://www.caritas.ab.ca/Home/Research/default.htm>] and intranet [<http://www.intranet2.capitalhealth.ca/CaritasResearch/>] pages.



For information on how you can support the Caritas Hospitals Foundation or for details on our Planned Giving opportunities, please contact:

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Caritas Research

Issue#10 Fall/Winter 2007

Centre for Lung Health

Lung Patients Breathe a Little Easier

For patients with chronic lung disease, it is fortunate that pulmonary specialist Dr. Fred MacDonald is stubborn. In 1992 when he was advised to "save the stamp" on his proposal for a respiratory rehabilitation program, he forged ahead anyway. Even though health-care funding was incredibly tight at the time, Dr. MacDonald's proposal was successful.

Although the beginning was modest – a pilot program with six participants – the improvement in quality of life experienced by the participants was significant. The results prompted Capital Health to support the program. Now known as Breathe Easy, the rehabilitation program runs year-round and registers approximately 400 people annually. It is one of the largest such programs in Canada.

"We tapped into a great need," says Dr. MacDonald. "Except for a very small rehab program at the University Hospital, there was no respiratory rehabilitation in Edmonton. I approached the pulmonary specialists who worked with me. They all supported it we knew it was absolutely necessary."

A growing problem

Chronic lung diseases – including asthma and chronic obstructive pulmonary disease (COPD) – affect millions of Canadians. COPD is a particular concern because of its rising prevalence – it is expected to be the third leading cause of death around the world by the year 2020. There is no cure for COPD, but treatment can help patients manage their condition.

Dr. MacDonald describes the typical COPD patient: An individual at least 45 years or older with a smoking history of at least 20 years. He or she claims to be perfectly well but has symptoms of cough. There may be sputum production, particularly in the morning. They become short of breath when climbing stairs. This shortness of breath becomes more noticeable when they walk with a friend and find they can't carry on a conversation.

"This is a patient in the early stages of COPD," says Dr. MacDonald. "Because many COPD patients in the early stages do not see themselves as being sick, they do not seek medical help. This is not a good situation because it is in the early stage that rehabilitation is particularly effective and can return a patient to an almost normal state. Early diagnosis is key, but it's something we don't do very well as yet."

Caritas was ahead of its time in bringing attention to the serious nature of lung diseases. The respiratory rehabilitation program set up by Dr. MacDonald in 1992 was established under the auspices of the Caritas Centre for Lung Health at the Edmonton General Continuing Care Centre. The idea was not only to provide rehabilitation services to patients but also to carry out a research program. At the time, there was limited research evidence that respiratory rehabilitation was effective for chronic lung disease.



The need for research

The Centre for Lung Health was an early adopter of stress testing for patients with chronic lung disease. This testing is used along with a number of other basic lung function tests such as spirometry, which measures how fast and how much air can be breathed out of the lungs. Stress testing evaluates how lungs function while patients work out on a treadmill and gives valuable insight into how patients perform functionally with exercise.

“This is the kind of testing that is done on professional athletes,” notes Dr. MacDonald. “Because we get a very accurate picture of lung function during exercise, we know what level each person is at and can tailor the exercise program accordingly.”



This detailed testing has also helped in characterizing COPD more fully. In the literature, the disease is categorized in terms of Stage 1 (mild COPD), Stage 2 (moderate COPD) and Stage 3 (severe COPD). The studies done at the Centre have contributed key information on defining the stages in terms of lung function during exercise.

The Centre also uses a standardized quality of life questionnaire for patients. The St. George's Respiratory Questionnaire measures symptoms (frequency and severity), activity (activities that cause or are limited by breathlessness), and impacts (social functioning, psychological disturbances resulting from lung disease).

“So we have physical, psychological and sociological measures on our patients,” adds Dr. MacDonald. “We test every patient before they enter the program and at the end of the program, and then again at six months, one year and two years. As a result, we have an extensive database for research.”

Breathe Easy

There are now approximately 4000 individuals in the database – all have participated in the Breathe Easy program. The program runs three times per week over a six-week period, or two times per week over eight weeks, with class size limited to 12 people.

It includes education and exercise training to help individuals better manage their own care, maintain independence and improve their physical fitness.

Participants learn about the proper use of medications; coping with fear, anger and stress; choosing healthy foods and the importance of exercise. The exercise session includes warm-up, stretching, breathing techniques, muscle strengthening, free weights, walking and the stationary bicycle and treadmill.

“We've seen tremendous results from the program,” says Dr. MacDonald. “By the time we see many of our patients, they are totally deconditioned. Exercise helps them get stronger and have much more reserve. Many, many people who suffer from

chronic lung disease choose not to go out in public because they are so short of breath. Breathe Easy has allowed many individuals to reconnect with their community. Some participants have even come off oxygen, which is very surprising. We see it every day at the Centre – rehabilitation really does work!”

But to convince others of the effectiveness of rehabilitation Dr. MacDonald knew he needed solid evidence. So in 2002, researchers from the University of Alberta's Institute of Health Economics followed 217 patients who had participated in the Breathe Easy program in 2001. Funding came from Caritas Health Group, Caritas Hospitals Foundation and the Alberta Lung Association.

Results of the study showed that participants experienced a significant increase in their quality of life. In addition, researchers concluded the rehabilitation program was cost-effective and helped reduce hospital visits by an average of 22 per cent and hospitalization days by 19 per cent in the study population.

More recently, the Centre has been involved in a number of research projects aimed at testing ways to help patients have more exercise capacity, particularly if they are on oxygen. (I understand there

Caritas Nurse Scientist: Donna Wilson, RN, PhD

Acute Delirium Nursing Study and Workshop Notification

Did you know that all but one of the research studies to date on acute delirium have looked at what physicians do to prevent or correct this condition? Yet, nurses are often the first to notice acute delirium, and nurses do a great deal to safeguard these patients and help them recover. Some reports show as many as 50% of all seniors who are hospitalized for surgery develop acute delirium, and others show that as many as 30% of all hospital patients may develop it. It would be very interesting and helpful to find out what nurses do about acute delirium! A Caritas nursing team is planning a study for this purpose. Caritas nurses will be invited soon to take part in this study, with questionnaires delivered to hospital units to make it easy to participate. This study involves two questionnaires - the first will ask for a list of what each nurse does about acute delirium, and the second will ask nurses to rank order in importance all of the nursing care that nurses tell us about in the first questionnaire. Once this study is done, this team is planning a workshop in the fall on acute delirium that will be open to all Caritas staff. If there are any questions, please contact your Caritas Nurse Scientist via donna.wilson@ualberta.ca

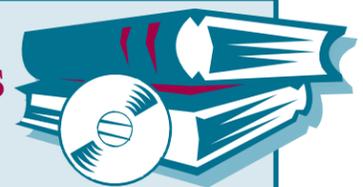
ONLINE/Computer Journal Club - Who is interested in participating?

Some Caritas nurses have told me they are very interested in starting an online/computer journal

club. I have been a member of one, where a group of nurses got together each month to talk about a published article that was distributed one month ahead. I found it was a good way to keep up on nursing knowledge and practice developments, and a good way to meet people and make friends. It would also be a good way to accumulate continuing competency hours. With Caritas nurses spread out in 3 facilities and most working shifts, an online chat line could work well for a journal club. Are you interested in participating? If so, when would you like it to start and what kind of articles would you like to read and discuss? This could easily be set up as a (free) ongoing computer service for nurses and others if interested. Please contact your Caritas Nurse Scientist if interested via donna.wilson@ualberta.ca



Caritas Libraries



Wondering where to find out about Library services at Caritas? Check out the Caritas Libraries intranet website at

www.intranet2.cha.ab.ca/caritaslibraries/

for information on: staff and the information services that they provide; library locations and hours; print and electronic collections and how to access them; and much, much more...

and three atmospheres of pressure, typically referred to as “diving” since the pressure change closely approximates scuba diving. This increase of pressure dissolves more oxygen into body tissue and blood so that the body is saturated with more oxygen than normal to enhance healing.

Hyperbaric oxygen therapy is delivered by placing the entire patient in a specially designed environment consisting of a clear plastic tube large enough to accommodate them. The air in this environment is then replaced with 100% oxygen and slowly pressurized. While the patient is in this environment breathing normally the lungs load the blood plasma with dissolved oxygen.

The current program received generous funding from the Caritas Hospitals Foundation to upgrade its two existing chambers. One of the original chambers has also been refurbished. The New chamber size allows for better management of critically ill patients, improve compliance for patients with confinement anxiety and allow parents or caregivers the ability to accompany Carbon monoxide poisoned or difficult children. This increased diameter also gives us the ability to treat obese patients who have been turned away due to technological restrictions. Further, pressure relief positioning and patient initiated position changes during the dive are accommodated in a larger chamber reducing the risk to existing wounds and development of pressure wounds.

The program also received funding from Capital Health to upgrade our existing facility. This renovation has been completed and allows for the ability to increase efficiency and patient privacy with additional

change rooms, increase future capacity with space for two additional chambers and provide space for patient assessment, review and diagnostic testing.

New research for treating Diabetic Foot Ulcers

A new report from the Canadian Agency for Drugs and Technologies in Health overviewing the cost effectiveness of HBO in Diabetic foot ulcers and preventing amputation has recently been released.

Key findings include

- HBO is more cost effective than standard care

- Adjunctive HBO for DFU is more effective (less amputations) than standard care.
- HBOT requires additional resources and planning (although the full impact of this assessment can likely not be done within Caritas as it would require an additional 179 chambers province wide).

The full report for perusal can be found at www.cadth.ca/index.php/en/hta/reports-publications/technology-overview

In addition it is our understanding that HBO for treatment of Diabetic foot ulcers will be incorporated into the regional wound care guidelines to identify those patients most appropriate for treatment. This will impact both our wound care and HBO assessment service.

Service demands will likely increase due to the changing demographic of people moving to Alberta (skilled labour with high risk factors for head and neck cancers).

In addition new chemotherapy and radiation protocols appear to be worsening soft tissue and boney structures when they present to COMPRU.

Chronic sternal wounds post bypass and transplant are a group of patients that may benefit from Hyperbaric Oxygen Treatment but require further study.

The past few years in the HBO community have led to a high degree of research and moved HBO to a much more evidence based medical service. For example Level one evidence, is now available for patients suffering from soft tissue radio necrosis.

We anticipate significant growth for HBO in the next 2-5 years. Since 1994 Caritas has been the only publically funded hospital based program in Alberta. It will be possible for Caritas to continue to be a Canadian leader in this specialty it is unlikely we will continue to be the only acute care HBO service in Alberta based on our service and research limitations.

References available upon request.

are some abstracts of this work – might want to indicate here what page they are on.) In addition, the Centre has hired a pulmonary physiologist Dr. Michael Stickland who is developing modifications to standard exercise regimes to achieve better lung function results. The work at the Centre is complemented by respiratory research at the Misericordia and Grey Nuns hospitals, which has focused on pharmaceutical agents.

Following up

To be truly effective, rehabilitation must continue beyond the six weeks of the Breathe Easy program. As with all exercise programs, maintaining activity can be a challenge. But patients with chronic lung disease face particular challenges. Many don't feel comfortable in a regular gym environment. And if individuals require oxygen, most gyms will not allow them to exercise in the facility.

To meet the need for continuing exercise, the Centre set up its own small gym for former Breathe Easy participants. Individuals are taught to do their own oxygen assessments and record them. They are free to use the equipment which includes universal machines, free weights, bicycles and treadmills. Oxygen is available and respiratory therapists check in periodically. The gym is open from 8am to 5pm, Monday through Friday. In 2006, the gym recorded more than 7000 visits.

Another aspect of follow-up is a social one. Many people forge friendships during the Breathe Easy program. They continue to meet in the gym and often gather at the Rendezvous café down the hall when they've finished exercising. Many Breathe Easy participants join the COLD (chronic obstructive lung disease) Club, a long-standing Edmonton-based social club which sponsors lectures, events and special outings.

The COLD Club has been a key supporter of the Centre. Funding has always been tight – about one third of the budget comes from donations and

fundraising events, most of which are run by the COLD Club.

Branching out

While the Breathe Easy program has been a boon for patients in the Edmonton area, the need for respiratory rehabilitation extends across Alberta. About three years ago the Centre began a respiratory telehealth program for five northern health regions.

It allows patients with chronic lung disease to participate in the Breathe Easy program remotely. Participants meet at the health centre in their local community for educational sessions broadcast from the Centre via videoconference, and then work through a supervised exercise program.



“Telehealth lets patients and families stay in their home communities and get the benefits from a top-notch respiratory rehabilitation program,” says Dr. MacDonald. “It's a win-win situation. The next step will be broadcasting to home computers. We're on the cusp of something very exciting for the care of patients with lung diseases.”

For Dr. MacDonald, it's been a long road from his residency at the Mayo Clinic in the 1960s when respiratory rehabilitation was one of his research projects. Returning to Edmonton to put his ideas into practice, he encountered more than his fair share of obstacles. Funding, space and administrative support have been constant challenges.

But he's never been challenged by a lack of people to share his dream. “The important thing to understand is that this is a team effort. The Centre, Breathe Easy and the telehealth program rely on the expertise of a wide variety of people – physicians, nurses respiratory therapists, the list goes on. Everyone involved in the Centre goes the extra mile. Why? We're motivated by the results we see every day. Patients who were very limited in what they could do are venturing out, being part of the community – and are feeling confident in doing so. It's rewarding work.”

TelePulmonary Story

Caritas Research Centre Publication



For over 15 years, the Caritas Centre for Lung Health Breathe Easy Program has provided Albertans with multidisciplinary respiratory rehabilitation treating Chronic Obstructive Pulmonary Disease (COPD), and other chronic lung diseases. By combining education and exercise, the program offers clients' the skills to cope with lung disease and develop and set personal strategies to improve functionality and quality of life.

But what happens when a patient can't get to the centre to participate in the program? That's where TelePulmonary Breathe Easy Program, offered by Capital Health Regional Telehealth, comes in.

"Most patients are so anxious, and this program gives them a safe place to exercise," says Dr. Fred MacDonald, Medical Director for the Centre of Lung Health. By using the TelePulmonary Breathe Easy Program, we can answer all sorts of questions and teach them techniques so they can live normal lives once again."

The TelePulmonary Program can be beamed from the Edmonton General Continuing Care Center in Edmonton to any health centre in Alberta through BEAM Telehealth. It allows patients in rural and remote areas to participate in programming not traditionally offered in their local area. Beyond just Central and Northern Alberta, BEAM Telehealth is also available in the Territories, British Columbia and throughout Saskatchewan. Clients are assessed by pulmonologists and other specialists in Edmonton

and participate in monitored exercise sessions locally, with a respiratory therapist from their community.

"The TelePulmonary Breathe Easy Program allows us to work closely with patients who may not pursue some of the follow-up care required to ensure best outcomes," says Blayne Iskiw, Regional Director for Capital Health Regional Telehealth. "That's always been BEAM Telehealth's number one goal."

As result of program participation in TelePulmonary Breathe Easy Program, clients noted improvements and impacts in their symptoms and daily activities with 70 per cent experiencing an increase in the distance they were able to walk in the post program exercise stress test.

If you would like to refer clients or to discuss the TelePulmonary Breathe Easy Program further, please contact Tina Jourdain, RRT, TelePulmonary Coordinator at 482-8951.

Did you know?

- 4.5 Million people in Canada smoke regularly or occasionally
- 45 per cent of all Canadians smoke or have at one time smoked
- 21 per cent of Albertans smoke, higher than the national average of 18%
- 750,000 Canadians suffer from COPD, and the numbers are rising
- COPD is the fourth leading cause of death in Canada
- COPD has replaced breast cancer as the leading cause of death among women in Canada
- A Canadian dies every hour from COPD

Hyperbaric Oxygen Program

Authors: Cliff Seville/Grant Paulhus, Therapeutics MCH, Caritas Health Group

Caritas is proud to carry the legacy of its founders into the modern world. The Caritas Mission is "Healing the Body, Enriching the Mind, Nurturing the Soul." Programs and services at Caritas combine leading edge science with a commitment to the values of dignity, respect, care, concern for all, community responsiveness, and responsible stewardship.

Caritas views its role in acute care, within the context of a regional and provincial system, as being focused on the provision of primary, secondary and select speciality acute care services. The Hyperbaric Oxygen Program (HBO) located at the Misericordia Community Hospital is one such service.

The Hyperbaric Oxygen Program provides a speciality service to residents not only of the Capital Region, but also the entire province of Alberta. Originally developed to support the Craniofacial Osseointegration and Maxillofacial Prosthetic Rehabilitation Unit (COMPRU) our service also

supports patient care through the Chronic Wound Clinic. Some conditions that are treated with HBO might be done in a clinic or outpatient environment; however, all approved conditions depending on severity may require the support of acute inpatient hospital care.

Hyperbaric oxygen therapy is used to treat a limited but diverse series of illnesses. It is the primary treatment for disorders such as severe carbon monoxide poisoning, decompression sickness and arterial gas embolism. It is also an effective adjunct for the enhancement of healing and has been used to treat patients suffering from radiation tissue injury, diabetic foot ulcers, crush injuries and compromised skin grafts and flaps.

Hyperbaric Oxygen Therapy is the medical use of 100% oxygen at increased atmospheric pressure. This increased pressure provides more oxygen to the body than is possible under normal atmospheric conditions. Most treatments range between two



HBO Team: Left to Right: Joanne Churchill, Angela Johnson, Michelle Campbell

influence individual health outcomes from PR.

Methods

Each year approximately 350 patients participate in the 'Breathe Easy Program' program at the Caritas Centre for Lung Health. Prior to entering the program complete pulmonary function testing is performed on each patient for proper diagnosis. Comprehensive cardiopulmonary exercise testing, quality of life assessment (SF-36 and St George's Respiratory Questionnaire), and an exertional walk test are then conducted on all patients before, and following completion of the 6-8 week PR program. The considerable patient sample, combined with the comprehensive patient assessment makes the 'Breathe Easy Program' ideal to examine how co-morbidities, disease severity and sex affects patient responses from PR.

Funding from the Caritas Research Committee allowed for Research Assistants to carefully review ~ 900 patient files dating back to January of 2005. With the assistance of the Integrated Centre for Care Advancement (iCARE: www.iCAREabouthealth.ca), a joint venture between Capital Health and the University of Alberta, the relevant data are currently being extracted from the Centre for Lung Health Database.

Results

Preliminary data are shown in Figures 1 and 2. Figure 1 illustrates the substantial increase in functional exercise capacity with PR in all patients as evaluated by distance covered in a 12 minute walk. Figure 2 shows the improvement in health-related quality of life as assessed by St George's Respiratory Questionnaire.

As illustrated in Figure 1, COPD patients that also have Coronary Artery Disease or Chronic Heart Failure appear to show similar improvements in exercise capacity as compared to all the COPD patients sampled. However in patients with heart failure, the increased functional capacity does not appear to result in much improvement in health-related quality of life. Preliminary results would also indicate that while females show significant improvement in both functional capacity and quality of life with PR, on average, they show less improvement in quality of life as compared to male patients.

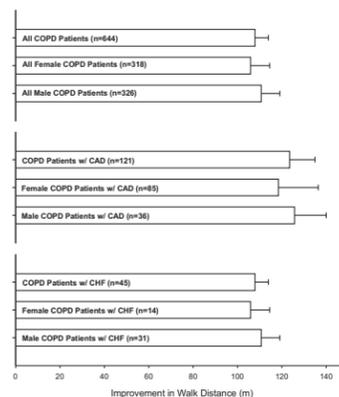


Figure 1. Improvement in functional exercise capacity with Pulmonary Rehabilitation in COPD patients as evaluated by distance covered in a 12 minute walk. NOTE: COPD = Chronic Obstructive Pulmonary Disease, CAD = Coronary Artery Disease, CHF = Chronic Heart Failure. N = the number of subjects in each group.

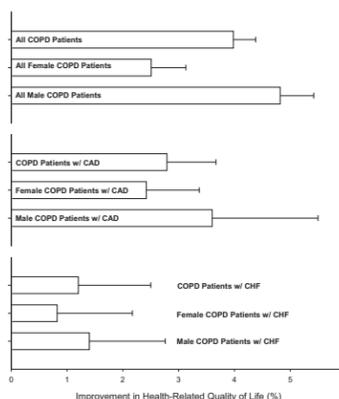


Figure 2. Improvement in health-related quality of life as assessed by St George's Respiratory Questionnaire following Pulmonary Rehabilitation. NOTE: See Figure 1 for the number of subjects in each group. COPD = Chronic Obstructive Pulmonary Disease, CAD = Coronary Artery Disease, CHF = Chronic Heart Failure.

Conclusions

Preliminary results confirm previous findings that, on average, COPD patients show clinically significant improvements in functional capacity and quality of life with PR. However, it would appear that COPD patients with heart failure as well as female patients may observe slightly less improvements in quality of life with PR.

This study will help in our understanding of what determines individual responses to PR in COPD patients. It is anticipated that knowledge gained from this type of research will help us to further individualize rehabilitation so that greater patient benefits can be achieved.

References available upon request.

Using Lung Volume Recruitment in Patients with ALS to Improve Volitional Airway Clearance and Increase Safety While Swallowing

Authors: Stuart Cleary, Sonya Wheeler, Sanjay Kalra and Wendy Johnston

The following abstract is from an ongoing study "Lung volume recruitment therapy and its effects on speech, swallowing, breathing, secretion management and quality of life in individuals with ALS". This research study under the auspices of the CHA-Caritas ALS programme; evaluations taking place at the Misericordia site and the University site with the collaboration of Sonya Wheeler, RT, of the Misericordia. This project recently received funding from the Caritas Research Trust Fund.

Background:

Lung volume recruitment (LVR) is manual insufflation and cough augmentation technique that is commonly used to help patients with ALS clear secretions from the lower airway. Although clinicians report positive results of LVR in terms of increasing lung volumes and improving cough effectiveness, limited research data are available to support its use [1] and no studies have included measurement of LVR's effect on coughing and other upper airway clearance behaviours while swallowing. A variety of volitional airway clearance behaviours are effective in ejecting sputum, oropharyngeal secretions, and aspirated materials from different portions of the upper and lower airways. These include volitional coughing and forced expiration to clear the lungs, trachea and larynx; throat clearing to protect the larynx and hypopharynx; hawking to clear the oropharynx [2]. The supraglottic swallow technique is an airway clearance behaviour that involves a voluntary breath hold and closure of the vocal folds while swallowing followed by a forceful cough to clear any residue and a second dry swallow.

Objectives:

The purpose of this study is to assess the effects of LVR on respiration, swallowing, and airway clearance and to test anecdotal reports that the improved cough associated with LVR continues after the treatment. The research questions are: What is the intensity and duration of the treatment effect, and does the effect generalize to other volitional airway clearance behaviours?

Methods:

Ten patients with ALS previously trained in LVR are being recruited to this ongoing pilot study. The research design is a one-group, pre-post test design (i.e., OXOO). Measures of forced vital capacity (FVC) and peak cough flows (PCF) during several airway clearance behaviours are being collected before, during and 15 and 30 minutes after a typical LVR treatment session.

Results:

Preliminary PCF results (n=3) indicate a robust treatment effect that lasted for up to 30 minutes following the LVR session and generalized to other volitional airway clearance behaviours, bringing them into a more effective range (i.e., between 160-200 L/min, the minimum peak cough flow required to eject material from airway [3]).

Spontaneous coughing improved from mean baseline of 175 to 241 L/m at 30 minutes after LVR (47% gain), (See figure 1). Post swallow coughing improved from 126 to 231 L/m (83% gain), post swallow throat clearing increased from 78 to 130 L/m (67% gain), post swallow forced expiration increased from 83 to 164 L/m (98% gain), and post swallow hawking went from 41 to 81 L/m (98% gain) (See figure 2). The supraglottic swallow technique improved from 166 to 231 L/m (83% gain) (See figure 3). FVC measures improved from a mean baseline of 2.45 to 4.0 litres during LVR (63% gain), remained at 3.10 litres at 15 minutes following the treatment (26% gain), but fell to 2.57 litres at 30 minutes.

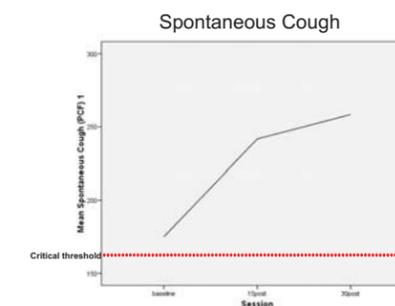


Figure 1. Unassisted coughing before and after LVR treatment.

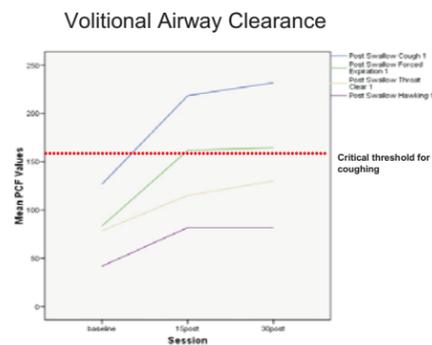


Figure 2. Four behaviors used to expectorate post swallowing residue

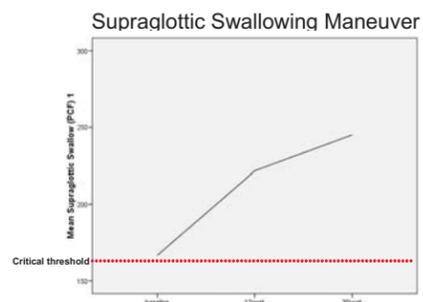


Figure 3. This compensatory technique involves a volitional pre-swallow breath hold, a forceful cough after swallowing and a second "dry swallow" to clear any residue in the airway.

Discussion/Conclusions:

Preliminary findings of the effects of LVR on measures of vital capacity and peak cough flows during airway clearance techniques are positive. LVR may offer increased airway protection if done prior to

eating. Data continue to be collected. Preliminary results have been accepted for presentation at the 18th International Symposium on ALS / MND.

References available upon request.

Misericordia ALS Clinic - Providing Respiratory and Nutrition Options to ALS Patients in Northern Alberta

Authors: Sonja Wheeler, RRT

Amyotrophic Lateral Sclerosis (ALS) is a progressive and ultimately fatal motor neuron disease. ALS affects the nerves that send messages from the brain to the voluntary muscles. As nerve cells degenerate, the muscles weaken and become nonfunctional. ALS can affect muscles of movement, speaking, swallowing, chewing and breathing. The cause and cure are unknown. Death usually comes as a result of respiratory failure, usually within 3 to 5 years after diagnosis.

In the fall of 2004, a multi-disciplinary ALS team was established at the Misericordia under the direction of Dr. Mark Heule - Respiratory and Critical Care Medicine and Dr. Sanjay Kalra - Neurology and ALS Clinic (University of Alberta Hospital). This satellite clinic of the University of Alberta ALS Clinic held its first clinic in January 2005. The objective of this team was to provide persons with ALS with timely access to respiratory support and nutrition management as lung function diminishes. Physiotherapy and Occupational Therapy provide assessment and resources for mobility and independence. Dietician and Speech - Language Pathology (SLP) assists with feeding and

swallowing, SLP also assists with speech and communication needs as required. Respiratory Therapy provides lung function studies, assessment of breathing during sleep, education about aids to breathing and secretion mobilization and initiation of non-invasive ventilation. Spiritual Care, ALS Clinic Coordinator, ALS Society Representative and Social Work provide support to the patient regarding end of life issues and advance care planning. All disciplines contact community home care to ensure smooth transition from hospital to home. The majority of ALS patients are able to be managed in the home with adequate family and home support.

The Misericordia Clinic utilizes current evidence-based management of symptoms for patients with ALS (1). Bi-level non-invasive ventilation offers improved quality of life and comfort by relieving symptoms of hypoventilation and therefore survival for persons with ALS by several months. Bi-level helps provide increased time in REM sleep, which allows for less daytime somnolence, less fatigue and less dyspnea off the treatment. For persons with ALS with difficulty in speech, lower than normal lung volumes and

shortness of breath, bi-level has assisted with communication with the family and caregivers.

Discussions around decision-making about Percutaneous Endoscopic Gastrostomy (PEG) occurs as respiratory function indicates level of surgical risk for the procedure (2). The PEG is inserted at the Misericordia in the High-Intensity area of ICU to coordinate initiation of non-invasive ventilation; if chosen by the person with ALS.

Due to relationships we build, many ALS patients now come to the Misericordia for their

medical care in emergent situations, when unable to cope at home or for palliative care.

The author is currently involved with the Lung Volume Recruitment study (mentioned in this newsletter) and will be presenting a poster **Amyotrophic Lateral Sclerosis: Support for the Journey** with the Alternate Level of Care team at the upcoming Capital Health End of Life Care Conference.

References available upon request.

What Influences Health Outcomes from Pulmonary Rehabilitation?

Authors: Michael K. Stickland PhD^{1,2}, G. Fred MacDonald MD², Monica Pratley RRT², Eric Wong MD^{1,2}

¹ Division of Pulmonary Medicine, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Canada
² Caritas Centre for Lung Health, Edmonton General Hospital, Edmonton, Alberta

Background

Research has shown that chronic obstructive pulmonary disease (COPD) patients show significant improvements in health outcomes with pulmonary rehabilitation (PR). Indeed as stated in a recent review 'the question is no longer should patients with COPD receive PR, but rather how should PR be delivered to patients and which components form the basis of a successful PR program'. Pulmonary rehabilitation has been shown to be a more effective therapeutic strategy for improving dyspnea, exercise endurance and quality of life in COPD patients as compared to traditional pharmacological management. Thus, PR has emerged as the new recommended standard of care for patients with chronic lung disease(11).

COPD is associated with many co-morbidities, particularly those related to cardiovascular disease (coronary artery disease, chronic heart failure, etc), likely because cigarette smoke is both the primary cause of COPD and a significant risk factor for cardiovascular disease. Indeed COPD patients with the most severe impairments in lung function are at the greatest risk for cardiovascular morbidity and mortality. COPD patients are typically not referred to rehabilitation until they are symptomatic, and as a

result, patients that begin PR are usually complex cases with multiple co-morbidities.

Many of the important papers examining health-related outcomes from PR either excluded patients with significant co-morbidities, or did not evaluate how co-morbidities influenced patient improvements with rehabilitation. Indeed despite the overall success of PR, a significant number of patients show little to no improvement in exercise capacity. Recent work suggests that patients with severe COPD show less improvement with PR as compared to mild to moderate COPD patients. Severe COPD patients would be more likely to have cardiovascular disease, however how this influences a patient's response to PR is unclear. Also, cigarette smoke appears to be more detrimental to women, and women present with COPD at lower levels of tobacco smoke as compared to men. Recent work examining a small patient sample suggests that female COPD patients may have smaller clinically significant improvements following rehabilitation as compared to male patients. However, this finding requires confirmation with a larger sample size.

Therefore we were interested in how co-morbidities, COPD disease severity and sex