

## Conference Highlights



### Should consideration of air pollution be part of exercise prescription in Cardiac Rehabilitation? Would the Air Quality Health Index (AQHI) be a useful tool?

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The relationship between air pollution and respiratory disease is well established, with strong evidence supporting, for example, that air pollution is a trigger for exacerbation of asthma; and the 2009 Canadian Asthma guidelines<sup>1</sup> advise: “Efforts to reduce exposure of patients with asthma to air pollution should continue; during periods of increased outdoor pollution, patients can minimize exposure by remaining indoors or reducing exercise outdoors.” Are

cardiovascular patients also vulnerable to air pollution, and should those caring for cardiac patients be counseling their patients in the same way?

There are no similar cardiac guidelines in Canada, although the Heart and Stroke Association<sup>2</sup> has reported that 69% of the approximately 6,000 additional deaths in Canada from exposure to air pollution are due to cardiac and cerebro-vascular disease.

The American Heart Association<sup>3</sup> recommends that “All patients with CVD should be educated about the cardiovascular risks posed by air pollution”; and that “Practical recommendations to reduce air pollution exposure should be given to at-risk patients.”

I will discuss the evidence base for the association between air pollution and cardiovascular disease; and then describe the Air Quality Health Index (AQHI), a tool available across most of the country that can be used in counseling patients to reduce health risk by avoiding exposure to air pollution.

#### Exposure

Although there have been great gains in reducing air pollution in many areas of Canada, and levels in Asian mega-cities are significantly higher, levels of pollution in Canada are still in the range that is associated with cardiovascular disease. When thinking of the health effects of air pollution, we divide exposure into:

- Long term (or chronic) exposures, which relate more to where you live, commute and work, and
- Short term (hours or days) exposures, which is related to both the concentration of pollutants in the air, and also to exercise; as with exercise, the

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# From the Editor

Warner Mampuya

It's with great pleasure that I take on my new role as Editor of CICRP. I would like to thank all the editorial board and all who submitted articles to this issue of CICRP for their hard work. This issue of the CICRP presents the highlights from the presentations, workshops and events of the recent annual cardiovascular conference held in Montreal from October 17 to 20, 2013. The conference dubbed VASCULAR 2013 was a unique Canadian event that brought together all major Canadian conferences dedicated to cardiovascular health and marked an unprecedented educational and community building opportunity. Recognizing the need for knowledge exchange in vascular health, all major cardiovascular health organizations joined forces to the realization of Vascular 2013.

The importance of such a high level nationwide collaboration cannot be emphasized enough because cardiovascular diseases remain the leading cause of mortality and morbidity in Canada.

The main purpose of Vascular 2013 was to promote the creation of a Canadian vascular community and to foster interdisciplinary research collaboration in vascular health. This was a good opportunity to expand and to focus on our understanding of vascular disease prevention and management. Vascular 2013 brought together Canada's leading experts and health care advocates from multiple sectors and health disciplines.

As always, CACR presented an exciting and

varied program that covered all aspects of cardiovascular rehabilitation. CACR meetings reflected the call for action issued during the conference, which called for the implementation of an integrated and multifaceted approach to address the prevention, treatment, rehabilitation and end-of-life care for people with vascular disease.

Multiple learning objectives were explored during this CACR conference. For instance, the development of Canadian public health interventions based on successful foreign experience in the prevention of CVD, the approach to vascular risk assessment in the asymptomatic patient, and the strategies to improve the efficacy of medical treatment were all included in the conference's subjects of discussion.

We should mention the 21st annual keynote Terry Kavanagh lecture which was delivered by McMaster nursing professor Heather Arthur. She is the first female and first nurse to receive the Terry Kavanagh Award, so it was not surprising that her lecture focused on women as patients, healthcare providers and scientists.

We hope that the articles and presentations selected for this highlight edition will help the readers reflect on this conference's call for action, meet some of the learning objectives and become inspired to contribute to the advancement of cardiac prevention and rehabilitation.

Finally, we take this opportunity to wish you all a wonderful New Year 2014.

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inhalation rate and consequently the volume of inhaled air per minute increases, increasing the dose of pollutants delivered to the lungs.

The ambient pollutants most described are:

- Particulate Matter (PM): these are complex small particles or droplets, with attached acids, organic chemicals or metals, which are suspended in air, the smallest of which can reach deep into the alveoli. They are described in terms of size: e.g. PM2.5 are particles less than 2.5 microns in diameter (a hair is 40-80 microns in diameter).
- Ozone is a colorless gas, produced in the air by complex reactions, which require heat and light; hence ozone is a summer pollutant.
- Nitrogen Dioxide is a pollutant found near roadways, and is a marker of Traffic Related Air Pollution (TRAP).

### Health effects

There is a large evidence base for association between air pollution and cardiovascular disease. This is well summarized in a scientific statement, and updates, from the American Heart Association<sup>3,4,5</sup>, and a recent summary from the Canadian Family Physician<sup>6</sup>.

Short-term exposure to air pollution is associated with increased rates of myocardial infarction and ischemia<sup>7</sup>, increased hospitalization and mortality from heart failure<sup>8</sup>, and increased incidence of arrhythmias<sup>9</sup> and strokes<sup>10</sup>.

Long-term exposure is associated with CVS disease and mortality; and as with second hand smoking legislation, reduction in air pollution has been associated with a reduction in both respiratory and cardiovascular deaths<sup>11</sup>.

The mechanisms of these relationships are complex, and are well described, especially for PM<sup>4</sup>. Long-term exposure to PM has been shown to accelerate the development of atherosclerosis, with a recent study showing an increase Carotid intima-medial thickness with long term

exposure<sup>12</sup>. Short-term exposure to PM leads to systemic inflammation and oxidative stress, and secondary endothelial dysfunction, arterial vasoconstriction and blood pressure responses; altered autonomic balance with effects on heart rhythm, and pro-thrombotic effects<sup>4</sup>.

### The Air Quality Health Index (AQHI)

The Air Quality Health Index (AQHI) is a risk communication tool, developed by Health Canada and Environment Canada that indicates the risk to health from current levels, and from levels forecast for the following day, of ambient (or community) air pollution. It measures a mix of pollutants commonly found in Canadian communities, and includes Particulate Matter (PM), Ozone and Nitrogen Dioxide. The AQHI is derived from epidemiological studies of these pollutants and mortality association in Canada, and it has been shown to be a valid indicator of morbidity as well<sup>13</sup>. The index is shown in figure 1, with health risk increasing from 1-10, or from low to moderate to high risk. Advice to reduce or reschedule strenuous outdoor exercise, thereby reducing exposure to pollution and reducing risk, is tailored for at risk groups and the general population. At risk groups include patients with pre-existing cardiovascular and respiratory disease, diabetics<sup>14</sup>, and the elderly (all groups seen frequently in cardiac rehab), as well as children, and people who are more exposed by working and exercising outdoors. At risk groups are advised to consider reducing or rescheduling strenuous outdoor exercise when the AQHI is at moderate risk (see Figure 2); although it is suggested that each person can self-calibrate, or figure out according to symptoms, at which AQHI level they are sensitive, and adjust exercise accordingly. The general population is advised to adjust activity only when the AQHI is at high risk.

Figure 1: The AQHI scale. (from Environment Canada. About the Air Quality Health Index. <http://www.ec.gc.ca/cas-aqhi/default.asp?Lang=En&n=065BE995-1>)



The AQHI is available in over 75 communities in every province across the country. It is available on the Health Canada and Environment Canada website ([airhealth.ca](http://airhealth.ca)) and various provincial websites; on radio and TV via the Weather Network; and through phone apps, widgets and eAlerts.

Ambient air pollution reflects a mixture of emissions from industry and hydro generation locally and carried in the atmosphere from

distant sources, and traffic. Traffic related air pollution (TRAP), both short term and long-term exposure, has itself been associated with cardiovascular disease<sup>15</sup>. Woodsmoke, from home woodstoves and wildfires, is also of concern<sup>16</sup>.

Heat is an independent risk to cardiovascular patients<sup>17</sup>. High risk AQHI days can coincide with heat episodes, but can occur any time of year, including in winter.

Figure 2: Air Quality Health Index Categories and Health Messages

(from Environment Canada. About the Air Quality Health Index <http://www.ec.gc.ca/cas-aqhi/default.asp?lang=En&n=79A8041B-1>)

Health Risk	Air Quality Health Index	Health Messages	
		At Risk Population*	General Population
Low	1 - 3	<b>Enjoy</b> your usual outdoor activities.	<b>Ideal</b> air quality for outdoor activities.
Moderate	4 - 6	<b>Consider reducing</b> or rescheduling strenuous activities outdoors if you are experiencing symptoms.	<b>No need to modify</b> your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High	7 - 10	<b>Reduce</b> or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	<b>Consider reducing</b> or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High	Above 10	<b>Avoid</b> strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	<b>Reduce</b> or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

### Counseling cardiovascular patients about air pollution

The Heart and Stroke Foundation<sup>2</sup> reported that only 13% of Canadians believed that air pollution had an impact on heart disease; while Nowka<sup>18</sup> showed that 57% of cardiology patients did not make the link, and that 92% had not been informed of this link by their health professional. So we are clearly not doing a good job in this regard. However we are missing a potentially effective intervention. 23% of asthmatics changed behaviour in response to public alerts about air pollution; but this number rose to 57% when advice had been given by their health professional<sup>19</sup>.

It would seem appropriate to counsel cardiovascular rehabilitation patients about the AQHI when prescribing exercise. The messages are simple:

1. Air pollution on moderate and high risk AQHI days could exacerbate your

cardiovascular disease.

2. Tune in to the AQHI daily; and self calibrate.
3. Reduce or reschedule strenuous outdoor activities according to the AQHI health risk.
4. Always exercise away from heavy traffic.
5. Stay indoors on extreme heat days.

Resources:

Accredited on-line courses:

UBC School of Environmental Health. Outdoor Air Quality and Health and the Air Quality Health Index. Available at: <http://spph.ubc.ca/continuing-education/current-courses/outdoor-air-quality/>

Extreme heat events program. McMaster University. Available at: <http://machealth.ca/programs/ehe/p/ehe-landing-en.aspx>

Patient educational materials: contact

[michele.charrier@hc-sc.gc.ca](mailto:michele.charrier@hc-sc.gc.ca)

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## Breathing is a Breeze: A Workshop to Teach Breathing Exercises in Cardiac Rehab

“...when the heart is affected it reacts on the brain; and the state of the brain again reacts through the pneumo-gastric [vagus] nerve on the heart; so that under any excitement there will be much mutual action and reaction between these, the two most important organs of the body.” - Charles Darwin, *The Expression of Emotion in Man and Animals*, 1872

*“My heart is going to stop.” This is what the patient whose case study we highlighted in this workshop reported thinking to himself as he started Cardiac Rehab (CR) (see handout on CACR website).*

After a heart attack many patients may have these thoughts, and the frequency of such thoughts will cause stress and anxiety. Clinical problems soon follow, as these thoughts cause anxiety attacks that can mimic the symptoms of a heart attack, and some of these patients do visit the Emergency. For clinicians managing patients in exercise-based cardiovascular rehabilitation programs, such complications are commonplace.

However, the remedies for such problems are not always obvious or easy to implement for clinicians.

The workshop, Breathing is a Breeze, provided participants with hands-on training for an easily implemented intervention: teach your patient how to breathe abdominally. Breathing exercises have not generally been integrated into CR treatment protocols, but there are organizational, symptomatic and functional benefits to doing so.

### Organizational Perspective

This year’s CACR Convention will be remembered

for a name change, from “Cardiac Rehabilitation” to “Cardiovascular Rehabilitation”. Canadian Association for Cardiovascular Prevention and Rehabilitation not only reflects similar name changes implemented in other countries, but more importantly better reflects the underlying physiological reality - that heart functions are intertwined with lung and brain functions through two systems that interconnect them: the circulatory and nervous systems.

As our name changes to reflect these broader realities, our interventions need to change as well. In most settings, we continue to do “cardiac” (i.e., heart focused) aerobic and resistance exercise prescriptions alone. However, the cardiovascular system includes heart, lungs and brain, and our ‘walking prescriptions’ are narrowly focused on elevating heart rates into the prescribed training zone. Nothing wrong with this, but what if the weakest link to recovery of the cardiovascular system comes from one of the other systems and goes undiagnosed?

For example, it is well known that breathing impacts both the heart and the nervous system. Dysfunctional (thoracic) breathing creates physiological challenges that provide a fertile soil for mental and symptomatic distress (Fried, 1999). In contrast, breathing diaphragmatically increases vagal tone and results in increases in heart rate variability, a factor known to relate to cardiovascular health (Nolan, 2008). As a result of diaphragmatic breathing, the patient enjoys the well-known beneficial effects of a sense of calm owing to increases in parasympathetic tone, and has improved capacity to exercise. So, is it now time to consider including breathing exercises in the treatment programs offered to our cardiovascular patients?

### Symptomatic Perspective

The case study discussed in the workshop presented with many challenges that could have derailed CR treatment:

1. Not able to do more than two minutes of exercise without feeling breathless (dyspnea)
2. Fearful about his health (fear of walking on back streets in case he collapses and is not found)
3. Moderate depression, with moodiness and cognitive symptoms (has trouble finding words to express his thoughts and is

- forgetful (like paying bills on time)
4. Supportive family, but he has distanced himself from his ethnic supports (because he is embarrassed about his low work status)
5. Feels he has lost control of his life and will never be able to enjoy good health
6. Insomnia (sleeps 2-3 hours a night)
7. No prior history of anxiety or depression

Many patients who struggle with anxiety and stress report symptoms that mimic cardiac symptoms like dyspnea. Other examples include rapid heart rate, feeling faint or light-headed, sweating, and chest constriction. What makes these symptoms particularly difficult is that patients themselves frequently panic when they arise, which in turn further aggravates symptoms; trips to Emergency often follow. The typical intervention is having patients use their nitroglycerin spray: if the spray works, the symptoms do not signal an acute heart attack.

While this helps, the problem is that this is a symptomatic intervention, not a functional one. The Breathing is a Breeze workshop proposed a functional solution to the problem of cardio-mimetic symptoms. After discussing where participants would consider intervening in this case, we focused on breathing through a hands-on demonstration of 1) how to assess breathing, and 2) how to help chest breathers become abdominal breathers.

### Functional Perspective

*“The breath is the horse; the mind is the rider” Tibetan Proverb*

Fifteen years ago, Jan van Dixhoorn (1998) published a seminal paper on the benefits of breathing and relaxation instruction to improve CR outcomes of myocardial infarction patients. He demonstrated a lower heart rate, respiratory rate, and improved respiratory sinus arrhythmia. Significant improvements in outcomes of these 76 cardiac patients were achieved from just six instructional sessions focused on teaching proper breathing technique. He then challenged the field to further investigate the benefits of breathing.

To date, the field of CR has not taken up the challenge of studying how and when to provide breathing exercises. Dixhoorn (1990, 2007) developed the Whole Body Breathing

intervention and has recently demonstrated that such breathing exercises reduce the occurrence of medically unexplained dyspnea (MUD) in non-cardiac patients. Measures of dysfunctional breathing (chest breathing vs. abdominal breathing) changed significantly for the treated patients as did their reports of dyspnea.

While there have not been any research studies examining the benefits of targeting dysfunctional breathing patterns among cardiac patients, this workshop reviewed a case study that showed that the combination of teaching abdominal breathing and providing a sleep intervention resolved all symptoms. With those two interventions alone, the patient was able to overcome his physical exercise limitations as well as his psychological fears and depressive symptoms, and return to active participation in his CR program. The patient returned to work within two months and was working full-time within another month.

Dr. Reitav has prepared a simple Behavioural Assessment of Breathing protocol for determining whether a patient exhibits the characteristics of dysfunctional chest breathing. He invited participants at the workshop to use the assessment tool to identify patients who might benefit from breathing exercises. He is now preparing video and audio teaching materials to train patients. Health professionals at CR settings interested in beta testing these materials are invited to contact him ([jaan.reitav@uhn.ca](mailto:jaan.reitav@uhn.ca)).

## Conclusion

Breathing difficulties are easily assessed, and breathing exercises are beneficial to patients. In addition, they can contribute meaningfully to key

goals highlighted at this year's CACR conference, namely:

1. Personalizing programming to address specific patient needs (Arthur, 2013), and
2. Broadening the range of patients treated, making programs more accessible to patients facing additional challenges that could prevent CR program completion (Clark, 2013).

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## Student Award Recipients

Recognizing our Outstanding Student Award Winners . . .

Each year the CACR supports research by holding an open competition for graduate students conducting research in a field related to cardiac rehabilitation. The CACR is very grateful to the Cardiac Health Foundation of Canada for providing 4 scholarships of \$3,000 each to qualifying graduate students submitting abstracts, each are reviewed by the CACR Research Committee and accepted for oral presentations or posters at the Symposium.



*Ashley Armstrong & Barb Kennedy*

*2013 Masters Level Winners*

## Titration of Nicotine Replacement Therapy in Smokers: The Mediation Effect of Nicotine Withdrawal

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**Background and Aims:** Smoking cessation is a life-saving intervention for individuals with vascular disease. Nicotine replacement therapy (NRT) has been shown to double a smoker's chances of quitting, however, there is evidence that the standard dose (21 mg) of transdermal NRT patch is insufficient to alleviate withdrawal symptoms. The objective of the current analysis was to determine if the relationship between nicotine titration and continuous abstinence (CA) at the end of treatment is mediated by nicotine withdrawal. **Methods:** Smokers (> 10 cigarettes/day) were recruited using media advertisements. Participants were randomly assigned to either the usual care (UC-NRT) group that received 10 weeks of standard dose transdermal NRT, or the experimental (EXP-NRT +) group that received 10 weeks of titrated transdermal NRT and NRT inhaler. All participants received five smoking cessation counseling sessions at weeks 1, 3, 5, 8 and 10 post target quit date. Nicotine withdrawal scores were collected at each time point using the Minnesota Nicotine Withdrawal Scale. The primary outcome was validated CA, expired carbon monoxide (CO), at the end of treatment (10 weeks). **Results:** Two hundred and sixty-two participants were included in the analysis (mean age = 48 years +/- 11.4). A logistic regression indicated that participants in the EXP-NRT + group had significantly higher quit rates (42.7%) compared to those in the UC-NRT group (29.8%),  $\chi^2$  (1, N = 262) = 4.8,  $p = .029$ . Participants in the EXP-NRT + group had significantly lower mean nicotine withdrawal scores over the 10 week treatment period (8.5) versus those in the UC-NRT group (10.7),  $F$  (1, 262) = 8.2,  $p = .005$ . Using the Baron and Kenny mediation procedure, treatment group and nicotine withdrawal were entered into the logistic regression model as predictor variables of 10 week CA,  $\chi^2$  (2, N = 262) = 27.9,  $p < .001$ . The effect of treatment group on CA, when controlling for nicotine withdrawal, was non-significant. **Conclusion:** Nicotine titration increased quit rates at the end of

treatment compared to those receiving standard dose NRT. Nicotine withdrawal mediated the relationship between nicotine titration and CA at end of treatment. Titration works by reducing withdrawal symptoms, thereby improving abstinence rates.



*Codie Rouleau & Barb Kennedy*

## Insomnia Symptoms are not Associated with Adherence to a Phase-II Cardiac Rehabilitation Program

*CR Rouleau<sup>1</sup>, KJ Horsley<sup>1</sup>, E Morse<sup>2</sup>, T Hauer<sup>2</sup>, S Aggarwal<sup>2</sup>, R Arena<sup>2,3</sup>, & TS Campbell<sup>1</sup>*

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**Background:** Insomnia symptoms (difficulty falling or staying asleep, early awakenings, and non-restorative sleep) are common in cardiac patients and are associated with mood disturbance, impaired concentration, and fatigue. Due to these adverse consequences, patients with insomnia symptoms may find it difficult to optimally adhere to cardiac rehabilitation (CR) program requirements. **Aim:** To determine whether greater severity of insomnia symptoms is associated with poor CR adherence, as indicated by lower attendance at supervised exercise sessions and at health education classes. **Methods:** Insomnia symptoms were measured using the Insomnia Severity Index (ISI) in 155 cardiac patients upon admission to a 12-week phase II CR program at the Cardiac Wellness Institute of Calgary. Data on attendance, demographics, and disease-related variables were obtained by chart review following program completion. Ideally, the CR program entails patients attending 24 supervised exercise sessions and  $\geq 2$  health education classes (e.g., nutrition, goal-setting). Separate, two-stage

hierarchical regression analyses were conducted with (1) supervised exercise attendance as the dependent variable (DV) and (2) health education attendance as the DV. In the first block, age, sex, risk stratification (based on American College of Sports Medicine guidelines), and depressive symptoms (Hospital Anxiety and Depression Scale depression index) were entered as covariates. In the second block, insomnia symptom severity was entered as the focal independent variable. **Results:** Forty-seven percent of patients endorsed at least sub-threshold insomnia symptoms (ISI >7) within the past two weeks, indicating mild to severe sleep difficulties. Patients attended an average of 15.85 (SD = 8.04) supervised exercise sessions and 2.40 (SD = 1.63) health education classes. Without insomnia symptom severity in the regression model, covariates accounted for 12% of variance in supervised exercise attendance [F (4, 127) = 4.40, SE = 7.66,  $p < .01$ ] but did not account for significant variance in health education attendance [F (4, 126) = 0.74, SE = 1.64,  $p = 0.568$ ,  $R^2 = .023$ ]. Insomnia symptom severity did not improve prediction of supervised exercise session attendance [ $\Delta F$  (1, 126) = 0.50,  $p = 0.481$ ,  $\Delta R^2 = .003$ ] or health education class attendance [ $\Delta F$  (1, 125) = 0.41,  $p = 0.525$ ,  $\Delta R^2 = .003$ ]. **Conclusions:** Insomnia symptoms are commonly reported by CR patients and warrant appropriate assessment and treatment, but they do not appear to interfere with CR participation. Future analyses should examine associations between insomnia symptoms and other indices of CR engagement (e.g., dropout, self-reported exercise, and changes in functional capacity).



*John Silbernagel, & Barb Kennedy*

## Using Seismocardiography to Assess Systolic Timing Intervals Pre and Post Exercise Training in Heart Failure: A Pilot Study

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**Introduction:** Seismocardiography (SCG) is a non-invasive technique that uses an accelerometer to analyze the mechanical events of a cardiac cycle. Three systolic timing intervals have been used to determine the mechanical efficiency of the heart; Pre Ejection Period (PEP), Left Ventricular Ejection Time (LVET) and PEP/LVET ratio. Individuals with Heart Failure (HF) go through a remodeling process that reduces the mechanical efficiency of the heart. The purpose of the study was to determine if exercise will produce an improvement in cardiac mechanics for individuals with HF. **Methods:** Data from four participants who attended a Cardiac Rehabilitation Program volunteered to participate. SCG tracings were obtained at the beginning, at 6 and 12 weeks of the rehabilitation program. The SCG was recorded in the supine position after a 10 minute rest. The accelerometer was placed 2cm above the xyphoid process along with a standard 2-Lead electrocardiogram. Thirty beats of each SCG tracing were annotated. Four points were analyzed; the onset of the Q wave, R wave peak, Aortic Valve Open (AVO) and Aortic Valve Closure (AVC). The R to R interval was used to determine Heart Rate (HR), Q wave onset to AVC was used to determine electromechanical systole and AVO to AVC was used to determine the LVET. The PEP was determined by subtracting the electromechanical systole from the LVET. All SCG periods were normalized for HR. A repeated measures ANOVA with a Bonferroni correction was used to test for significance. **Results:** All participants were male (n=4) with Dilated Cardiomyopathy (49.3±5.7years, 175.5±4.8cm, 100.7±36.2kgs, BMI 32.8±10.3, Ejection fraction 24.5±8.2%). Exercise adherence was 76.4%. All participants were taking  $\beta$ -blockers and ACE inhibitors. Three of the four were using diuretics and one was using digitalis. There were no medication changes throughout the study. The results of the exercise training produced no significant change in LVET but resulted in significant changes to the PEP (F=(2,178)=27.525,<0.001) and PEP/LVET ratio (F=(2,178)=17.50,<0.001). **Conclusions:** Systolic timing intervals are dependent on physiological aspects of the cardiac cycle such as preload and afterload. An increase

in end-diastolic volume leads to a greater amount of blood ejected from the ventricle during systole and therefore increasing cardiac output (Q). Our study leads to a significant decrease in the PEP and therefore an increase in EDV and Q.



Luke Martelli & Barb Kennedy

## Measuring Postural Balance in Patients with Cardiovascular Disease

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**Background and Aims:** Research has shown that patients with cardiovascular disease (CVD) have decreased levels of postural balance. Thus, levels of balance should be assessed prior to designing cardiac rehabilitation (CR) exercise programs. However, typical methods used to assess functional balance (e.g. Berg balance scale) may not be sensitive enough to detect changes in postural balance due to the wide range of functional ability in these individuals. Thus, a more discrete tool is required to assess balance in this population. The Community Balance and Mobility Scale (CBMS) may be the most suitable assessment technique as it is able to detect subtle changes in postural balance. However, it has not been previously used with

CR patients. The purpose of this study was to assess the psychometric properties of the CBMS as well as to characterize postural balance in patients participating in CR programs. **Methods:** Twenty-four participants were recruited from local CR programs. Study participants performed the CBMS as well as computerized dynamic posturography measures performed on the Neurocom Pro Balance Master. Since the CBMS is usually administered by a trained physiotherapist (PT), the inter-rater reliability of PT and non-PT scores was examined in a subset of this group (n=8). Floor and ceiling effects were assessed to determine the suitability of the CBMS for a cardiac population. Dynamic posturography assessments also were analyzed to further characterize the balance of patients participating in CR programs. **Results:** The results showed that PT and non-PT CBMS assessment scores were strongly correlated ( $r = 0.95$ ) and showed minimal bias (mean difference = 0.625). The differences in the scores between PT and non-PT fell within the calculated 95% limits of agreement (maximum difference =  $\pm 7$ ). No floor or ceiling effects were observed for the CBMS ( $64 \pm 14$ , minimum=21, maximum=85). Dynamic posturography assessments showed that CR patients had the slowest movement velocity, lowest directional control, and least limits of stability in the anterior and posterior directions. These impaired balance capabilities in the anterior and posterior directions may contribute to the overall decreased levels of balance in CVD patients. **Conclusions:** The findings of this study demonstrate that the CBMS is a suitable field assessment technique that can be reliably administered by non-PTs to assess postural balance in individuals with CVD. Thus, the CBMS represents a novel assessment technique that can be used to assess and monitor postural balance in patients participating in CR programs.

## Walk of Life Fundraiser helps CR programs across Canada

Through the National WALK OF LIFE campaign over \$1 Million was raised for cardiac rehabilitation across the country in 2013 with over 5,500 participants at 22 different cardiac rehab centres. Participating members of the CACR are eligible to participate in this program and raise money directly for their own cardiac rehab centres and also receive grants back from

the Cardiac Health Foundation of Canada, along with T-shirts, custom designed and printed brochures and posters. Each centre justifies utilizing their monies raised and grants received back for medical equipment, patient and public awareness, materials, lectures, professional education, research and facilities. The 30th anniversary of the very first WALK OF LIFE

will be celebrated on Sunday May 25, 2014 in Toronto at the Evergreen Brick Works and an anticipated 2,000 will be in attendance.

### 2013 NATIONAL WALK OF LIFE ~ Participating Programs

Cardiac Prevention and Rehabilitation Services, Rouge Valley Health System	Toronto, ON
Health Sciences North Cardiac Rehabilitation Program	Sudbury, ON
Ross Memorial Hospital, Cardiac Rehab Program - The Beat Goes On	Lindsay, ON
Cardiac Fitness Association	Breslau, ON
COACH Cardiac Rehab	Kelowna, BC
McMaster Cardiac Rehabilitation Program	Hamilton, ON
GTA Walk of Life - Cardiac Health Foundation of Canada	Toronto, ON
Toronto Rehab Institute Cardiac Rehab Program	Toronto, ON
PMCC Cardiovascular Rehabilitation and Prevention Program	Toronto, ON
Lakeridge Health Regional Cardiac Rehab Program	Oshawa, ON
Healthy Hearts Comprehensive Cardiac Rehab Program	Goderich, ON
YMCA Healthy Heart Program	New Westminster, BC
Southlake Regional Health Centre, Cardiovascular Prevention & Rehabilitation	Newmarket, ON
Cardiovascular Health & Wellness Program, Saint John Regional Hospital	Saint John, NB
Cardiac Wellness Program - Horizon Health Network	Miramichi, NB
Chaleur Regional Hospital Cardiac Rehab Program	Bathurst, NB
FitLife Program - Cardiac/Pulmonary Rehab & Risk Management Exercise & Education	Prince Albert, SK
Cardiac Wellness & Rehab Centre - Trillium Health Centre	Etobicoke, ON
Reh-Fit Centre	Winnipeg, MB
Oxford County Cardiac Rehab & Secondary Prevention Prog.	Ingersoll, ON
Cardiac Wellness Program/ Coeur en sante	Moncton, NB
Cape Breton Heart Lung Wellness Program	Sydney, NS

### Sponsor Recognition

We are forever grateful for the contributions and on-going support of the following sponsors. The opportunity to provide the latest products, education and financial contributions, allow CACR to bring in quality speakers, on topics that are relevant to our members. Thank-you!





# CALL FOR ABSTRACTS & STUDENT SCHOLARSHIP AWARDS

## CANADIAN ASSOCIATION OF CARDIAC REHABILITATION ANNUAL MEETING AND SYMPOSIUM

October 25-26, 2014, Vancouver Convention Centre in conjunction with Canadian Cardiovascular Congress

The Canadian Association of Cardiac Rehabilitation is now accepting abstracts for either podium or poster presentations for the 2014 Annual Meeting and Symposium.

Presenting an abstract at the CACR Annual Meeting is an excellent opportunity to share your research, best practices, and highlight your facility to colleagues and leaders in the field of Cardiac Rehabilitation. Abstracts are welcome on any topic pertinent to **cardiac rehabilitation, prevention and chronic disease care**. **Accepted abstract titles, authors and credentials are printed in the Journal of Cardiopulmonary Rehabilitation and Prevention (JCRP) Convention Issue, September/October 2014 and the CACR produced Current Issues in Cardiac Rehabilitation and Prevention (CICRP) Conference Highlights issue. *Full abstracts will be included in the online version of the same issue.* Posters are seen by a wide variety of cardiovascular professionals at the CCC/CACR conference.**



"At first the thought of applying for a national scholarship was daunting; my work against others across Canada, there's no way it can compete! During my studies, I was fortunate enough to be able to submit a few smaller projects for the CACR abstract competition [as poster presentations]. I found this process relatively quite simple. The hardest part of the process was whittling my abstract down to the 400 word requirement and waiting for the response! This helped grow my confidence and refine some methodologies that I have used. When attending the conference, it was great to hear feedback from many other professionals who have different insights and "tips" on how to improve different aspects of my work. I feel this has helped me grow as a researcher. Applying for the CACR Graduate Scholarship was just as easy! I am honored to be able to contribute to such an outstanding organization. I encourage all graduate students who are part of the CACR to submit their abstracts to the CACR annual conference, what an honor it would be for you to be nationally recognized and plus it looks good on your curriculum vitae!" - Jonathan Silbernagel, Regina University; Masters Level CACR Graduate Award Winner 2013

Abstracts & Student Award Application: [www.cacr.ca/awards/CACRAwards.cfm](http://www.cacr.ca/awards/CACRAwards.cfm)

Deadline for submissions: May 1, 2014

Completed applications must be submitted through a NEW online application process! Please be sure your application is completed in full, as changes will not be accepted after the deadline. Please contact CACR if you do not receive email confirmation of your submission within 72 hours.



1390 Taylor Ave. Winnipeg, MB R3M 3V8  
Ph 204-928-7870 Email: [member.services@cacr.ca](mailto:member.services@cacr.ca)



## 2014 Board of Directors

Leanne Lemieux, Member Services



From left to right: Jean Diodati - Montreal, Jennifer Harris - Ottawa, Tracy Selway - Truro, Caroline Baer - Moncton, Rick Stene - Saskatoon, Dennis Humen - London, Darren Warburton - Vancouver, Carolyn Chessex - Toronto, Simon Bacon - Montreal, Shauna Ratner - Vancouver, Kerri-Anne Mullen - Ottawa, & Robert Reid - Ottawa.

### Upcoming Web Education Session

Building Community Capacity - the Heart Wise Exercise Model *By Jennifer Harris*  
February 12, 2014 at 1 PM ET - Register today at [www.cacr.ca](http://www.cacr.ca)

## Canadian Cardiac Rehab Registry (CCRR) Update

Kristal Heise, Special Projects Coordinator

2013 was another tremendous growth year for the CCRR. Participants at our Annual Meeting and Symposium in Montreal reported what we have been forecasting for years: their funders are putting more pressure on them to demonstrate objective outcomes in order to justify their programs' sustainability and resources. As a result, we are witnessing an urgency among Canadian CR programs to capture data electronically (if they are not already doing so) and to share their data with the CCRR so they can access large Canadian datasets to illustrate CR program effectiveness. This is demonstrated by an almost 50% increase in programs contributing, testing and/or undergoing preliminary discussions internally to connect to the CCRR since Vascular 2013.

### 2013 Highlights

- The CCRR Research Sub-Committee produced the first ever Annual CCRR Research Report. The document entitled, "The Canadian Cardiac Rehab Registry: Inaugural Report on the Status of Cardiac Rehabilitation in Canada" shares CCRR results from adiposity to wait times. Watch for it in publication soon.
- As a result of in-person meetings with representatives from major CR programs in Quebec, a commitment from a local champion to link Quebec CR programs with the CCRR was achieved, bringing us closer to our goal of being a truly Canadian registry.

- As we move forward into 2014, we are excited to report that the first CCRR data dictionary revision is underway. A team of highly qualified and results-oriented CR and data experts are working to create “CCRR 2.0”: a dataset better reflective of current Canadian CR service delivery and congruent with Canadian Cardiovascular Society guidelines for cardiovascular data collection in Canada.
- In support of our efforts to best commentate the patient journey through the cardiovascular care continuum in this country, we continue our conversations with representatives from other cardiovascular registries in Canada regarding linkage of our datasets. We believe connecting the CCRR to registries that capture other segments of the cardiovascular care continuum will create an enhanced and more complete understanding of the patient journey and clarify opportunities to improve upon it.

It is because of Pfizer’s support that 2013 was another successful year and why we are well-poised for important ongoing growth in 2014; we are tremendously grateful for their ongoing support.

A sincere thank you to all CCRR Committee members that give repeatedly of their time and tremendous expertise – the remarkable growth and evolution of the CCRR is a direct result of your commitment and hard work!

## Hello 2014...Get on Board!

Is your Program seeking more information about CCRR participation in 2014? A CCRR Webinar may be for you! CCRR Webinars are hosted by CCRR experts and designed to allow Canadian CR Programs to see the CCRR in action, understand the benefits to participation and answer questions specific to your Program’s participation.

Is your Program ready for CCRR participation? Getting started is easy! The first step is to decide how you will share your Program’s data. Do you use an electronic data capture system such as a Microsoft Excel spreadsheet, a Microsoft Access database, hospital or commercial electronic database system? You can upload that data directly from your electronic data-capture system to the CCRR. Do you collect data on paper? Why not consider directly entering your data into the CCRR instead? Once you decide how you are going to participate, CACR will support you in establishing the specifics of your participation, including navigating the details of information-technology and applicable privacy regulations.

If you or your Program staff are interested in learning more about CCRR participation, wish to take part in a CCRR Webinar or you have questions about CCRR participation, please contact Kristal at [kkiland@cacr.ca](mailto:kkiland@cacr.ca).

## Message from the Executive Director

Stacey Grocholski - CACR ED

It was great to see everyone at the 2013 CACR Conference, in conjunction with Vascular2013! It was a unique event with four additional groups coming together to form Vascular2013, anticipating more reach, knowledge sharing and networking opportunities. This one-time event was sure to be the highlight of the year!

Every year, CACR utilizes the conference to host our Annual General Meeting and showcase what the Association has been working on and the progress it has made throughout the year. Besides, presenting the ‘formal’ part of the meeting (financials and voting in elected board members), we presented and voted on the revised by-laws and name change which is a significant milestone in the Association’s history. Highlighting some of the new marketing materials and future creative

direction, was also displayed as part of the re-branding presentation. Lastly, information was shared that the board of directors met prior to the conference and focused on the financial health of the Association. It was clearly identified that a new business model would be developed in the new year and consultation from the membership would be sought out. The process will be led by a Consultant, who has experience in helping similar organizations achieve successful outcomes and move to financial stability. Please stay tuned for monthly updates in the new year.

Finally, I invite everyone to take advantage of all the great educational materials and services CACR has to offer in 2014 and I look forward to seeing you in Vancouver in October!

## Conference Highlights

Stacey Grocholski - CACR ED

- 159 delegates attended the CACR Conference; over 6500 attended Vascular 2013!
- Over 100 delegates networked and socialized at the Vieux Port Restaurant in Old Montreal. Food was great and networking games were lots of fun!
- A mix of science and practical learning was evident throughout the program and this was reflected in some workshops and plenaries with standing room only!
- Sponsor feedback was very positive and they enjoyed getting the opportunity to get to know your needs and how they could provide solutions for you and your patients.
- Survey responses indicated more balance between science and practical applications. The 2014 Conference Planning Committee is actively working on providing more of this, with hot topics and exciting speakers – stay tuned!



## Volunteer Committee Members wanted!

CACR is actively recruiting for the Marketing & Development Committee and Knowledge Transfer Committee.

The Marketing & Development Committee meets monthly to identify the needs of the organization and matches this with potential partnerships. This will include, seeking sponsors for the Annual Conference & Symposium, Canadian Cardiac Rehab Registry, educational webinars and general support for the Association. For more information, please contact Dennis Humen, Marketing Chair at [dennishumen@gmail.com](mailto:dennishumen@gmail.com)

The Knowledge Transfer Committee is actively recruiting committee members to provide strategic direction, generate ideas and implementation of these initiatives. The goal of the Committee is to facilitate knowledge translation and continuous development of professionals in cardiac rehabilitation through varied means including the annual symposium, systematic reviews, web education, online resources, and guideline clinical tools. For more information, please contact Darren Warburton, Knowledge Transfer Chair at [darrenwb@mail.ubc.ca](mailto:darrenwb@mail.ubc.ca)



## Knowledge Networking Resources

### ***Benefits of joining or renewing your membership!***

- **Attend regular CACR webinars** - offering CEC credits soon!
- **Conference discounts** - registering under CACR, provides you access to education, networking opportunities, student scholarships, ability to share research and contests offered to CACR delegates only
- **Journal of Cardiopulmonary Rehabilitation and Prevention (JCRP)** - Receive six issues annually of the official journal of CACR.
- **Current Issues in Cardiac Rehabilitation and Prevention (CICRP)** - latest topics and current research in our exclusive online publication. Submissions welcome!
- **3rd Edition Guidelines** - receive discounts, direct link to your membership account and access to slide presentations of each chapter
- **Access to resources & tools** - log into your Membership Centre for educational materials and tools you can use with your patients.
- **Affordable membership prices** - options for 1, 2 and 3 year payment plans.

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