



Women and Heart Disease

What Every Health Professional Should Know About Prevention of Cardiovascular Disease in Women

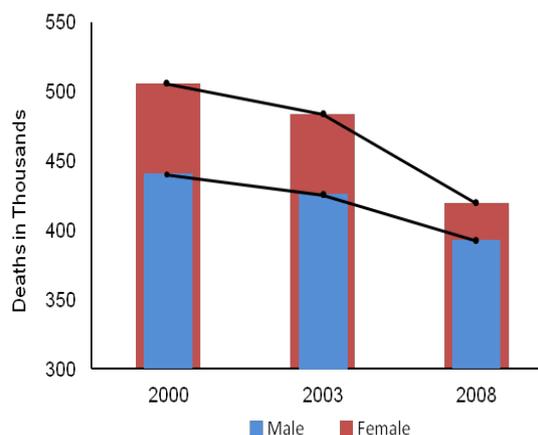
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Introduction

Cardiovascular disease (CVD) remains the leading cause of death in women in the United States and worldwide, accounting for more than 400,000 U.S. deaths annually¹. Over the last decade targeted public service awareness campaigns², major randomized clinical trials, and development of evidence-based clinical guidelines have advanced our understanding of CVD in women and

2000, cardiovascular mortality has decreased dramatically for women, with the decline being more rapid than that for men (Figure 1)^{1,3,4}. The differences in CVD mortality between women and men vary with age, with an 8 to 10 year delay in the age of onset of coronary heart disease (CHD) in women⁵. Whereas women age > 55 years old have experienced a decline in mortality from CHD, the obesity epidemic is thought to contribute to stagnation in the CHD mortality rate in young, premenopausal women, those 35 to 54 years old⁶. The challenges manifest in these data prompted the American Heart Association to revise their 2007 guidelines on cardiovascular prevention in women with a 2011 Update⁷. The focus of this article is to present a systematic approach to risk classification and stratification, with emphasis on preventive interventions that should be encouraged by cardiac rehabilitation (CR) professionals to improve adherence to recommended therapies.

Figure 1: Death from Cardiovascular Disease in the United States: 2000-2008



Adapted and modified from Thom et al., 2006; CDC; and Roger et al. 2012

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From the Editor

Lea Carlyle, MA

Cardiovascular disease remains the leading cause of death in women and despite the known benefits of cardiac rehabilitation (CR), women still do not participate. Barriers have included lack of physician referral, family and work commitments, lack of transportation and co-morbidities. The journey to cardiovascular health in women starts with prevention, but as CR professionals, we can also do our part to find strategies to increase awareness and attendance in CR as well as provide alternative programs to accommodate the changing demographics of women living with atherosclerotic and non-atherosclerotic forms of heart disease. This Spring issue is dedicated to Women and Heart Disease which we last reviewed in 2005. Much research has been added to the literature since that time and we hope to provide you with some of those updates.

Our Feature articles include “What Every Health Professional Should Know about Prevention of Heart Disease in Women” by Dr. Jacqueline Green and colleagues and “Exploring the Cardiac Toxicity of Cancer Treatment in Women with Early-Stage Breast Cancer” by Amanda Manoharan and Dr. Christine Brezden-Masley.

Adding to the research on women and heart disease in regards to enhancing attendance at cardiac rehabilitation (CR) and assessing the priorities and needs of women are Dr. Jennifer Price and Dr. Danielle Rolfe. Dr. Price tested a telephone coaching intervention based on Stanford’s Chronic Disease Self-Management Program immediately post discharge to encourage women to attend CR intake appointment. Dr. Rolfe looks at the current health promotion and physical activity priorities, preferences and practices of older and rural women living with heart disease that may help to inform the development of relevant and appropriate recommendations and/or programs to meet the post-event needs of this population.

References and Reviews have been submitted by Kelly Angevaare. She reviews 2 articles, one looking at cardiac syndrome X and microvascular heart disease in women and CR for women across the lifespan.

Our Case Study has been written by Maria Ricupero

from Toronto Rehabilitation. She introduces us to Health At Every Size (HAES®) which is an approach that focuses on overall health rather than just weight loss to assist individuals in adopting healthy behaviours that are sustainable. Her case studies provide examples of how a weight centred focus can be detrimental to a patient’s psychological and physiological well being and how incorporating HAES® may help to empower the patient.

We last had an update from Women’s College Hospital in 2005 on the Women’s Cardiovascular Health Initiative, a “women only” CR program which was created in 1995. In this update, they discuss the recent rise in referrals of younger women with non-atherosclerotic cardiac conditions diagnosed during or immediately following pregnancy and what needs to be considered during assessment and treatment.

As many of you are aware, in December 2012, the International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) was officially formed with the initial coming together of 13 cardiovascular prevention and rehabilitation associations from around the world. Associations are in agreement that they are willing to make a commitment to promote cardiovascular prevention and rehabilitation around the globe by sharing experiences and knowledge to impact the health of those living with cardiovascular disease. John Buckley has collated responses from the international partners on what it means to be a part of an International Collaboration. An update from the International development meetings in Paris is also included.

We’d like to say congratulations to Cleo Cyr who was presented with the Diamond Jubilee award by the Heart and Stroke Foundation of New Brunswick in recognition of her significant contribution to helping reduce the burden of cardiovascular disease in New Brunswick.

Lastly, Stacey Grocholski, CACR Executive Director brings us some updates in CACR in From the Office. Please do not hesitate to contact any member of the Editorial Board with suggestions for upcoming CICRP issues.

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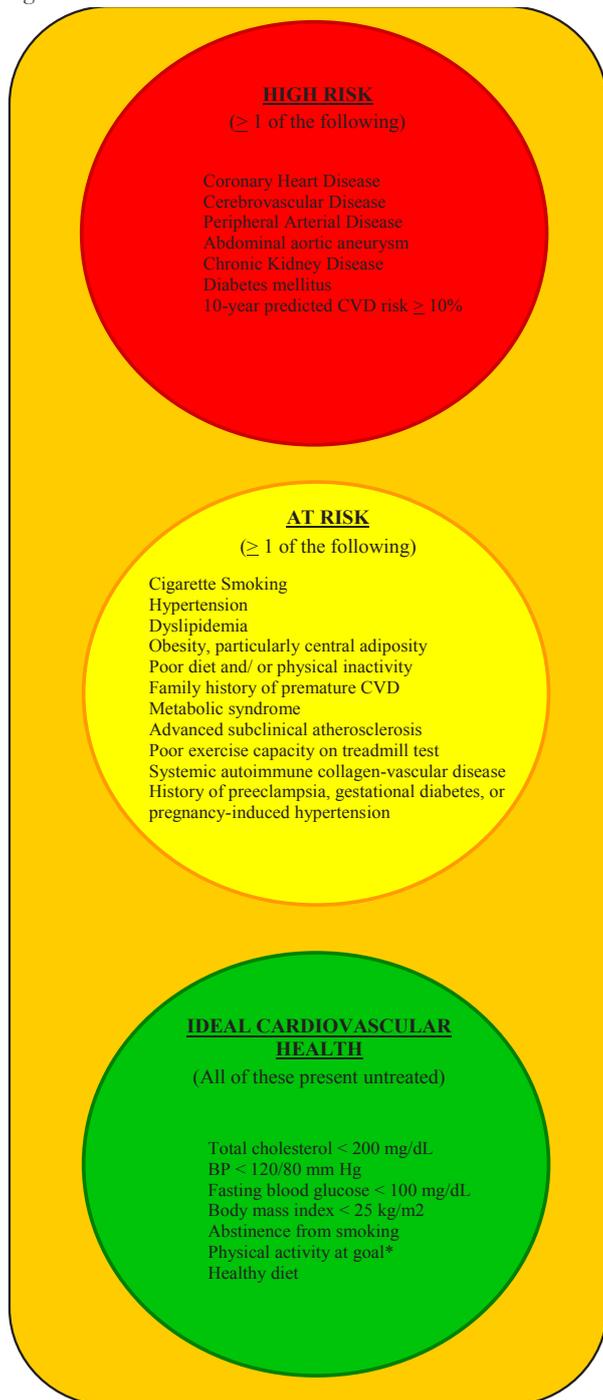
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Cardiovascular Risk Assessment

Within the 2011 Guideline Update, risk stratification remains the cornerstone of preventive recommendations⁷. Based on systemic and critical review, the 2011 Update stratifies women into three groups: at high risk, at risk, and at ideal cardiovascular health (Figure 2). This approach expands on the conventional short term event risk measure (i.e. Framingham risk score) by taking into consideration family history, differences in risk in non-white populations, and the prevalence of CVD in women. In doing so, the current guideline revises the previous short term CHD risk to address lifetime all cause CVD risk.

Figure 2: Risk Classification of Women's Cardiovascular Health.



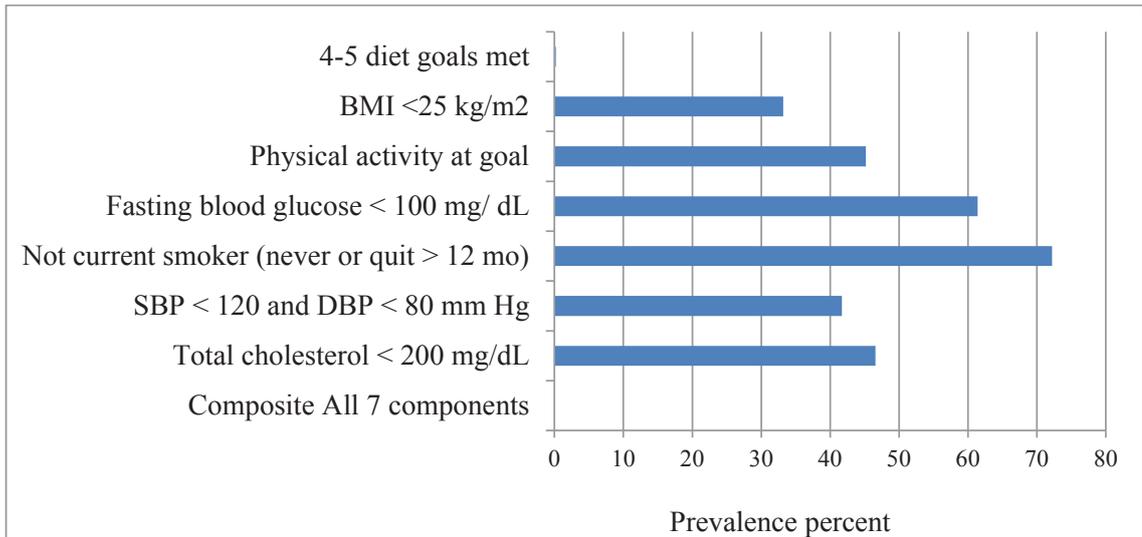
The majority of women referred to CR are in the high risk classification. This high risk classification

now includes a 10 year predicted CVD risk of > 10%, which is a significant change from the 2007 document that used a cut off of 20% 10 year predicted coronary artery disease risk⁷. This change reflects the increased CVD risk in women related to congestive heart failure and stroke, in addition to their CHD risk⁵. Other high risk diagnoses include clinically established CHD, peripheral arterial disease (PAD), abdominal aortic aneurysm, chronic kidney disease, and diabetes mellitus. This new, more assertive, threshold for classifying women as high risk coincides with evidence supporting the cost-effectiveness and efficacy of statin therapy⁸. The 2011 Guidelines reiterate the importance of CR for patients after acute coronary syndrome, coronary artery bypass surgery, and percutaneous coronary intervention. The guidelines recommend referral prior to hospital discharge or at the first follow-up office visit. Women with the above diagnoses, or with PAD or chronic angina within the last year should also be referred for comprehensive outpatient cardiovascular rehabilitation.

The 2011 “at risk” category differs from the 2007 guidelines in incorporating a history of systemic autoimmune collagen-vascular disease and a history of pregnancy-induced complications that portend increased CVD risk⁷. Mounting evidence demonstrates a link between systemic autoimmune collagen vascular disease and CVD⁹. For example, women with rheumatoid arthritis have two- to three-fold increased risk of myocardial infarction (MI) and 1.7 fold increased risk of stroke¹⁰. Similarly, women who experienced pregnancy complications such as pre-eclampsia have an increased relative risk of 3.7 for hypertension, 2.2 for ischemic heart disease, and 1.8 for venous thromboembolism¹¹. Although the exact mechanisms remain elusive, endothelial damage from an inflammatory response is likely a major contributing factor. The updated guidelines should prompt healthcare professionals to take a detailed history of pregnancy complications as part of a comprehensive CVD risk assessment. As depicted in Figure 2, several lifestyle characteristics place a woman at risk for CVD. These include cigarette smoking, obesity, poor diet, and poor exercise capacity on treadmill testing. Finally, a diagnosis of hypertension, dyslipidemia, metabolic syndrome, family history of premature CVD or advanced subclinical atherosclerosis all place a woman at CVD risk.

The classification of “ideal cardiovascular health” establishes the goal behaviors and characteristics for middle aged and older women for longevity and sustained quality of life. Although data from the National Health and Nutrition Examination Survey (Figure 3)¹ and a community-based study of a middle-aged population found a less than 10% prevalence of ideal cardiovascular health, these standards present tangible goals for women and public health officials¹².

Figure 3: Prevalence of US Adults Meeting Criteria for Ideal Cardiovascular Health.



Adapted and modified from Roger et al., 2012

Approach to Cardiovascular Disease Prevention for Women

After an initial physician assessment for CVD risk, lifestyle interventions should be implemented⁷. Regardless of CVD risk classification, the 2011 Update recommends that all women engage in four key behaviors: smoking cessation, regular physical activity, DASH-like diet, and weight management. Despite their importance, physicians do not consistently counsel women on these behavioral changes. CR specialists are in a unique position to interact frequently with patients during the post-discharge period, affording the opportunity to emphasize these recommendations. Figure 4 depicts checklists of the Class I and Class II recommendations for women, delineated by CVD risk classification. The Class I recommendation for physical activity is a goal of at least 30 minutes of moderate-intensity aerobic activity daily, five days weekly. Additional health benefits may be realized by increasing moderate-intensity exercise to 300 minutes per week. Strength training more than twice weekly is also beneficial. Class I recommendations for diet emphasize the importance of consuming fruits, vegetables, whole-grain and high fiber foods. Intake of saturated fat, cholesterol, alcohol, sodium, sugar, and trans-fatty acids should be limited. Weight management to achieve a BMI of < 25 kg/m² is advised⁷.

The 2011 guideline update classifies a few previously popular interventions as not useful and which may be harmful. Antioxidant vitamins such as C, E, and beta carotene are not recommended for the prevention of CVD. Although folic acid supplementation in addition to dietary changes may be advisable for high-risk women with elevated homocysteine levels as secondary prevention, folic acid is not recommended

for CVD prevention in most women. Combined estrogen and progesterone and unopposed estrogen menopausal hormone therapies are not recommended for primary or secondary prevention.

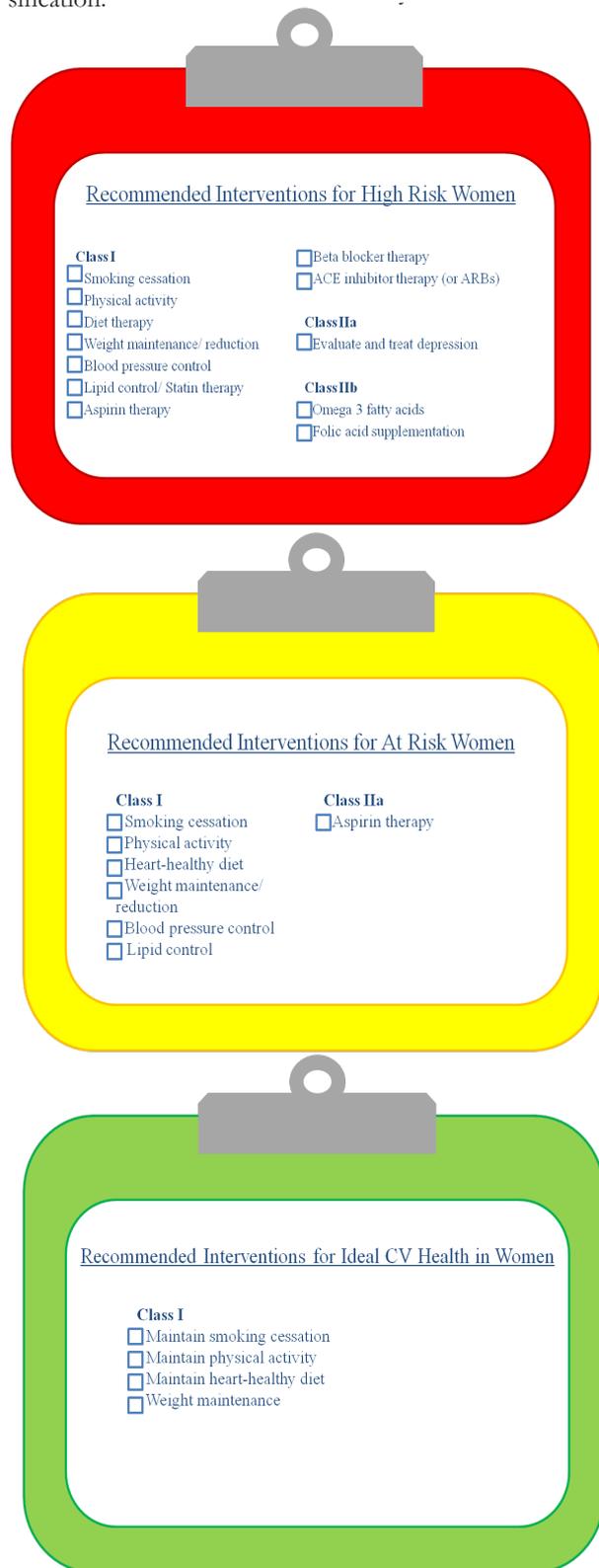
The 2011 guideline does not recommend vitamin D supplementation, due to ongoing research that will likely clarify its role in CVD prevention. The VITamin D and Omega-3 Trial (VITAL) is currently investigating the effects of these supplements on risk of CVD and cancer in both women and men¹³. In this randomized, double-blinded, placebo-controlled study, the primary endpoints are total cancer and a composite of MI, stroke, and cardiovascular mortality. Emphasis will be placed on the difference in outcomes between ethnicities, as African-Americans have greater risk of vitamin D deficiency than Caucasians. Vitamin D will not be supplemented with calcium in this trial as recent research suggests an association of supplemental calcium with MI and CVD events.

Aspirin has long been considered appropriate for secondary prevention in all women. However, in women classified as at risk or at ideal cardiovascular health who are < 65 years of age, current evidence does not support the use of aspirin for coronary prevention, although stroke prevention has been shown.¹² Thus aspirin is not recommended for primary prevention in women who are not at high risk for CVD⁷. In women > 65 years of age not at high risk for CVD and who have controlled blood pressure and are not at risk for gastrointestinal bleeding or hemorrhagic stroke, a dose of 81mg daily of aspirin is reasonable for coronary and stroke prevention⁷.

Implementation of AHA Guidelines

Collaboration involving the woman, family, and healthcare professional team is essential to effectively implement national CVD prevention guidelines.

Figure 4: Intervention Checklist of Cardiovascular Disease Prevention Recommendations for Women by Risk Classification.



Despite the best available evidence, women are not prescribed about 50% of recommended preventive care¹⁴ and non-adherence to prescribed therapy presents challenges to achieving ideal cardiovascular health. Lifestyle interventions are particularly difficult, with marginal adherence¹⁵. Cardiac rehabilitation programs and secondary prevention programs (CR/SPP) can uniquely bridge the chasm between acute inpatient cardiovascular care and the requisite lifestyle changes necessary to optimize cardiovascular health.

Cardiovascular events requiring inpatient assessment, such as stroke, MI or acute decompensated heart failure can serve as the sentinel event to motivate behavioral change. CR/SPPs offer comprehensive services to women to assist them in their transition to healthy behaviors and appropriate medical management¹⁶. Despite the well-demonstrated benefits of CR/SPPs¹⁷, these programs are drastically underutilized, particularly for women and older adults¹⁸. Patient-related obstacles to adherence include lack of financial resources, inadequate social support, and low health literacy, to name a few¹⁶. Provider-related obstacles include low physician referral rates and lack of coordination of care between the inpatient and outpatient environments. Some of these barriers can be ameliorated by involving the entire care team in the discharge planning process. For example, inpatient nurses and physical therapists can promote outpatient rehabilitation to patients and encourage development of automatic referral processes in their institutions¹⁹. Efforts to improve referral to CR/SPPS and knowledge of the guidelines by CR specialists are important initial steps toward improving guideline implementation.

“Cardiovascular events requiring inpatient assessment, such as stroke, MI or acute decompensated heart failure can serve as the sentinel event to motivate behavioral change.”

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Research in Progress

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If older and rural women are not attending cardiac rehabilitation, what are they doing?

Introduction

Women's under representation in cardiac rehabilitation (CR) compared to men has been consistently demonstrated by a number of researchers: typically 10-20% of eligible women participate in CR, compared to 25-31% of eligible men.^{1,2} The underrepresentation of women in CR is most often attributed to a lack of physician referral of female patients to CR,³ though the cause of this gender bias at a physician level is unclear.² Implementation of systematic strategies of referral to CR have been recommended to address inequities in access to existing CR programs,⁴ but the impact of such strategies on women's CR participation is still under investigation. Other barriers to women's CR participation that have been reported in the literature include a lack of transportation, the perception of exercise as tiring or painful, and living with comorbid health conditions.⁵ It is likely that these barriers are experienced more acutely among older and rural women, and this

may (in part) explain the underrepresentation of these populations in CR compared to their younger and urban counterparts.^{6,7} Despite the important work of these and many other researchers, few changes in rates of women's participation in CR have been reported over the course of a decade.⁸

Background

In addition to CR not being accessible to many women, it is possible that CR programs as they are currently structured are not relevant to the health and physical activity (PA) needs, preferences and priorities of older women living with heart disease. It must also be noted that the development of contemporary CR programs was based on studies of younger men (aged 40-50 years) needing to return to work, and involved modes of physical activity that were familiar to this population (e.g., treadmill walking, jogging, stationary cycling).⁹⁻¹¹ Thus, it is reasonable to assume that the experiences and needs of the changing demographic of individuals living with heart disease (including a growing number of women and older adults) requires a concomitant revision in the format of existing programs, and this has been recommended and explored by other authors.^{3,12-14}

Study Rationale and Purpose

Improved systems of referral to CR for eligible women⁴ and an increased availability of women-only/women-focused CR programs are important initiatives to improve women's participation in CR. Such initiatives, however, are unlikely to meet the needs of all women, particularly those of older and rurally-based women. Moreover, even if all eligible women (and indeed all eligible men) attended CR, existing programs would require a budget increase of 200-790%¹⁵: such an increase in funding is highly unlikely given Canada's current health funding situation. Given these issues, the purpose of this study is to assess the current health promotion and physical activity priorities, preferences and practices of older and rural women living with heart disease to inform the development of relevant and appropriate recommendations and/or programs to meet the post-event needs of this population. Arguably, by finding out what this population does and prefers, in terms of health promotion and physical activities, that health counselling and exercise prescriptions for this population following a cardiac event are more likely to be understood, initiated and maintained.

Methods

A mixed method design, involving a mail survey and in-depth qualitative interviews, was employed to describe and explore the PA and health promotion practices, preferences and priorities of older women (≥ 65 years) living with cardiovascular disease (CVD) (having received treatment for CVD in the two years prior to the study) in the Champlain health region of Ontario. The self-administered mail survey was conducted between September and December 2010, and descriptive statistics, bivariate and logistic regression analyses were used to assess survey responses (N=127, 50% response rate). Nearly 35% of survey respondents reported living in a rural community, and respondents were on average 76 years of age (Mage = 75.8 \pm 6.3 years).

In-person, semi-structured qualitative interviews were conducted with a subgroup of survey respondents (N=15) between May and September 2011. Grounded theory methods were employed to analyze the interviews, and to develop relevant themes to describe participants' experiences with CVD, CR, PA and other health promotion practices.^{16,17}

Implications of the Study for Cardiac Rehabilitation Practice

The results of this study will provide a description of participants' health promotion priorities, PA (structured and incidental) practices, and preferences related to where and with whom older women prefer to be physically active. Whether these priorities and preferences differ based on CR attendance will also be assessed. Qualitative analysis of interviews with

participants will provide in-depth descriptions of what participants do to maintain or improve their health following the experience of a cardiac event. In particular, the role of incidental PA (i.e., unstructured PA such as completing household tasks, walking for transportation, food preparation and gardening) will be explored in order to develop recommendations for CR practitioners who provide exercise counselling for this population of women.

Given that the majority of women do not attend available CR programs, the information generated from this study is key to increasing the relevance and uptake of PA counselling, particularly for older and rural women following a cardiac event.

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Research in Progress

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Preliminary Results of a Coaching Intervention to Enhance Women's Attendance at Cardiac Rehabilitation

Although the benefits are well substantiated, cardiac rehabilitation (CR) is still largely underutilized¹, with women comprising only 12–24% of contemporary CR programs² even though the prevalence of coronary artery disease in men and women is similar.³ Current evidence suggests that once enrolled in a CR program, women have high drop-out rates and often do not continue with healthy exercise regimes following completion of a formal CR program.⁴ Several studies have examined barriers to women participating in CR programs. For example, Ades, Waldmann, McCann & Weaver⁵ report that physicians are less likely to refer women to CR than men. Other studies have identified commute time, denial of disease, depression and financial issues as barriers for women participating in CR.⁵⁻⁷ Automatic referral has been suggested as an intervention to increase CR attendance.⁸ Recent studies have suggested that, even with an automatic referral system in place, only 50–70% of patients will attend the intake assessment, with fewer numbers continuing on to participate in CR.^{9,10}

Traditionally, strategies to address a treatment gap have been aimed at physicians and have been seldom effective. More recently, interventions are being developed which are aimed at the patient and called “self-management strategies.” McAllister et al.,¹¹ in a systematic review, found these self-management strategies to be effective in reducing coronary risk factors. Strategies to support and assist patients in developing the knowledge, skills and self-confidence to self-manage their chronic condition are varied. In particular, a coaching strategy has been shown effective in assisting patients attain target levels for their total cholesterol.^{12,13} Coaching was directed at the patient and included assessment, education, assertiveness training, goal setting and re-assessment. Allen et al.¹⁴ utilized a nurse e-coach intervention to provide self-management support via the internet.

The intervention targeted self-efficacy, patient education and motivation to improve health and was aimed at engaging and empowering patients.

Little is known about interventions that may enhance attendance at CR intake assessment. Self-management strategies, such as coaching, may empower patients, enhance self-confidence and give them the knowledge and skills to work with their health care team. Coaching by a trained health care professional (HCP) can be directly targeted at the factors influencing intake and the barriers to program intake. Coaching that would provide information, promote empowerment, enhance confidence and address individual barriers to CR programs, could enhance attendance at CR intake appointment. Women may derive a benefit from formal linkages to coaches following a cardiac event.

This pilot trial was testing a telephone coaching intervention based on Stanford's Chronic Disease Self-Management Program (CDSMP) and designed to support participants' self-management skills immediately post discharge as they waited for CR intake appointment. The intervention included both practical information such as the benefits of CR, location of CR programs, and guidelines on communicating with HCP but also employed strategies to promote behaviour change such as goal setting, action planning and problem solving skills.

Participants were recruited from a tertiary care hospital located in the Greater Toronto Area (GTA), which utilized an automatic referral system for all patients eligible for CR. Ethics approval was received from the institution and the University of Toronto. A randomized controlled trial design with stratification for age, enrolled women with cardiovascular disease referred for CR.

In addition to usual care, women randomly assigned to the intervention group received individualized coaching, designed to support self-management, delivered by telephone. The coaching program consisted of scheduled coach-generated telephone calls made between hospital discharge and CR intake appointment to explain the benefits of CR, clarify

concerns, motivate women to assume management of their healthcare and daily decision making and assist participants in overcoming any individual barriers to entering a CR program.

This intervention was standardized and started within one to two weeks of hospital discharge. Calls were scheduled every two weeks, which allowed participants to practice new skills, and permitted follow up of patient goal setting and problem solving. Calling over this time frame also allowed participants to identify potential barriers and find solutions and resources. All telephone calls were scheduled and initiated by the investigator. The initial telephone call was scheduled with patients following randomization.

During the telephone calls the investigator covered goal setting, defining problems and barriers, problem solving and decision-making. The intervention was based on Stanford University's CDSMP, a six week program designed to help patients with chronic illnesses develop self-management strategies. The investigator offered problem solving support and strategies to build confidence.

Preliminary Results

Participants were generally married, had multiple comorbidities and had been hospitalized for coronary artery bypass graft surgery.

To evaluate the content of the coaching intervention coaching logs were completed during each telephone call. These logs recorded the duration of the call, content covered and patient concerns. All participants were provided with information concerning self-management, goal setting, and the benefits of CR. This information was loosely scripted and repeated on several occasions during the series of telephone calls. While participants would discuss action planning, few were able to remember their plan on follow up telephone call and frequently asked for review of the benefits of CR and communication strategies. In addition, participants were very interested in learning how to form partnerships with HCP and using the take "PART" strategy¹⁵ for communicating with their physicians. This strategy for communication involves having patients prepare for appointments by generating lists of questions, ask the questions, repeat instructions and take action – either by following instructions or voicing concerns and barriers to the plan. Many participants had ongoing medical issues following their discharge and this lead to specific medical questions concerning such issues as wound healing and medication usage. These participants were encouraged to discuss these issues directly with their physician and the take "PART" strategy¹⁵ for communication was reviewed, helping participants to formulate specific questions. In particular, participants were not aware that letting their physician know they were unwilling or uncomfortable taking certain medications would help the physician make

alternative suggestions. Participants who complained of chest discomfort were reminded of the directions for nitroglycerin use and when to seek medical aid. Future interventions may consider providing patients with some basic cardiac health education as part of the coaching intervention.

Many patients had specific questions concerning resources such as accessing physicians or a specific CR. Often participants had not reviewed their discharge package, which contained this information. Future interventions should consider providing participants with templates for developing action plans and goal setting.

Although the content and dose of the intervention varied, participants were satisfied with the individuality of their coaching experience. The information provided was useful and assisted them in identifying resources. Participants indicated that the telephone coaching assisted them in solving their problems and helped them talk to their doctors. All participants indicated they would recommend this intervention to a friend and only one felt she did not have enough contact with her coach. Results from this pilot trial are consistent with others who have found favourable participant evaluations of their self-management support or coaching experience. Participants in the coaching intervention had complex medical issues such as open wounds, infections and respiratory complications requiring home oxygen therapy. While no medical advice was provided the researcher was able, by virtue of her cardiovascular expertise, to assist participants in seeking medical care and dialoguing with HCP.

Summary

In conclusion, the telephone coaching intervention designed to enhance self-management was feasible and participants were highly satisfied with the intervention. The importance of self-efficacy enhancing interventions and the development of self-management skills was recently stressed in the 3rd edition of the Canadian Guidelines for Cardiac Rehabilitation and Cardiovascular Disease Prevention.^{16,17} The authors strongly recommend incorporating self-efficacy enhancing interventions into a framework designed to train participants in self-management skills. The early provision of these skills could serve as a bridge to entry to CR. Telephone coaching interventions may be especially important for those women waiting to attend CR programs who live in rural areas, where distance and geography may restrict access to other forms of self-management support.

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References & Reviews

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Women, Cardiac Syndrome X, and Microvascular Heart Disease

Arthur H et al. *Can J Cardiol* 2012; 28: S42-S49

Estimates of between 10% and 30% of patients complaining of persistent angina symptoms are found to have non flow-limiting coronary artery disease during angiography, a clinical entity termed cardiac syndrome X (CSX). Women represent the majority of this population and are found to be at increased cardiovascular disease (CVD) risk. This paper provides an overview of recent progress in CSX research and identifies current knowledge gaps.

Possible causes of CSX listed in this review include diffuse atherosclerosis obscured from angiography, systemic inflammation, and microvascular disease due to endothelial dysfunction. An association between the presence of metabolic syndrome (a grouping of three or more known CVD risk factors) and risk of developing CSX among women has been suggested. Other researchers have noted abnormal pain perception as a possible explanation of CSX in women.

This review paper emphasizes the current lack of clinical practice guidelines for CSX, suggesting

that scientists and clinicians are far from fully understanding its causes and best methods for diagnosis. Given the prognosis of CSX and associated increased cardiovascular disease risk, the authors propose that risk factor modification be addressed in this population. Although not clearly stated in the paper, referral of women complaining of persistent chest pain despite normal angiographic testing to cardiac rehabilitation programs affords an opportunity for comprehensive CVD prevention and risk factor management.

Cardiac Rehabilitation for Women across the Lifespan

Daniels KM et al. *Am J Med* 2012; 125: 937.e1-937.e7

Recognition of the short and long-term benefits of cardiac rehabilitation (CR) is increasing, with CR referral now embedded in best practice guidelines. Despite this recognition and change in current guidelines, CR remains significantly underutilized, particularly among women.

Daniels et al.'s paper effectively illustrates that some physicians and female patients themselves may believe that attending CR is "not worth the trouble", and that

conflicting priorities such as financial and caregiving roles limit women's time available for self-care. Daniels et al. also note that cardiovascular disease tends to present at a later age in women compared to men, and thus physical deconditioning, the presence of comorbidities, and reliance on adult children for transportation are probable barriers to accessing and participating in CR programs.

The authors provide evidence of the numerous benefits women can achieve through CR participation. The opportunity for CR to provide women with feelings of social inclusion is highlighted in this article. Associated benefits of socialization include reducing

anxiety or embarrassment related to comorbidities, body image concerns, and lack of prior exercise participation.

Daniels et al., in addition to other authors, propose the design of CR programs that address the unique physical and psychosocial needs of female cardiac patients. However, greater endorsement of CR and increased referral to CR may be just as important to women's CR participation, if not more pressing. Ongoing education of physicians and community health providers about the benefits of CR for women is encouraged, as is the empowerment of women of all ages to take an active role in their health management.

Health At Every Size (HAES®) – Adopting a Realistic Approach to Health Outcomes

Maria Ricupero, MHSc, CDE, RD, Clinical Dietitian, Professional Practice Leader; Cardiac Rehabilitation & Secondary Prevention Program; Toronto Rehab/University Health Network

Research studies indicate that better health outcomes are achieved with a 5-10% reduction in body weight.¹ As a result, clinicians frequently focus on weight loss as a marker for improving metabolic parameters. Not surprisingly, weight loss is a major goal for many cardiac rehabilitation (CR) patients. However, few patients are successful achieving their weight loss goals and “95% of people who lose weight, regain it”.^{2,3} Promoting better health by emphasizing weight loss is failing our patients. According to Aphramor & Gingras,⁴ “the most consistent outcome of weight loss behaviour at 2 years is weight gain and frequently weight cycling” (p.197). When a patient does not achieve their weight loss targets, they often report feeling as though they have failed the program and ignore other positive health outcomes such as increased VO₂, improved metabolic parameters (i.e., blood glucose levels, lipid profile) and quality of life indices (e.g., better sleep patterns, more energy).

Studies show that when fitness level, activity, nutrient intake, weight cycling and social economic status are controlled, the increased risk of disease due to obesity is significantly reduced or disappears altogether.⁵ Furthermore, an “obesity paradox” develops as recent evidence reveals that overweight and obese individuals with diabetes may have lower mortality rates compared to those at “normal” weight.⁶

Health At Every Size (HAES®) offers a different approach to well-being and encourages a shift in focus away from body size to one of weight-neutrality and supports healthy behaviours and attitudes of individuals.⁷ A randomized controlled trial compared HAES® to a controlled diet approach. The results revealed no change in body weight and improved psychological parameters (e.g., self-esteem,

body image) in the HAES® group; whereas, those in the controlled diet group regained weight and psychological parameters worsened.⁸

The following case studies will demonstrate how a weight centred focus can have detrimental consequences on a patient's psychological and physiological well being. In contrast, implementing a HAES approach in CR can provide patients with adopting healthy behaviours that are sustainable.

Case #1 - “I work so hard, but nothing changes; all my hard work for nothing.”

Pauline is a 50 year old single woman of Jamaican background. She was diagnosed with Type 2 diabetes three years ago. She is hypertensive and reports having sleep difficulties. She takes metformin 500 mg twice daily for diabetes. Her lipid and glucose profile are within target. Pauline lives with chronic high stress related to insecure housing, financial instability and social isolation. For a living, she cleans corporate offices.

Prior to joining the program, Pauline was sedentary. She has a history of joining various weight reduction programs where she lost weight, but regained it. She expressed feeling “tired of dieting” and “resents eating vegetables;” and she associates eating healthy foods with dieting. When Pauline was first diagnosed with diabetes, she was provided with a 1200 calorie meal plan to promote weight reduction. Pauline followed the meal plan until she experienced hypoglycemic symptoms (e.g., weakness, shakiness and fatigue) that impacted her ability to perform her job.

When Pauline joined CR, her goal was to lose weight because she was informed that losing weight

would help ameliorate hypertension. She adhered to an exercise prescription of walking 2.5 miles in 50 minutes, five times weekly. She also received nutrition counselling from a registered dietitian (RD).

Table 1: Case # 1 Pauline

	Baseline CPA Results & Measurements	3 month CPA
VO ₂ (ml O ₂)	13.4	15.9
RHR (beats/min)	74	62
BP (mmHg)	145/86	132/76
Weight	105.5kg (232 lbs)	104.5kg (230 lbs)
BMI	40.5	40.1
%BF	46.8	45.5
WC (cm)	110	105
A1c	0.06 (Jan. 2011)	0.058 (May 2011)

Pauline learned about the health benefits of good nutrition and how to incorporate nutritious meals. She gradually introduced ‘new’ foods into her diet to increase her intake of fruit, vegetables and legumes. Her three month cardiopulmonary assessment results revealed positive changes (See Table 1) despite minimal weight loss. Unfortunately, Pauline felt like a failure because she was conditioned to measure her success by pounds lost. As a result, she felt very discouraged.

Practice Points

The HAES® philosophy focuses on how food provides nourishment and therapeutic benefits beyond calories. The goal is to eat well to promote or improve overall health and well being. The shift away from weight loss helped Pauline recognize the other positive health outcomes she achieved. This improved her relationship with food and she eventually expressed wanting to incorporate healthy eating so that “it’s part of my life and not because I need to lose weight.” The shift away from weight loss helped improve her self-efficacy; that is, confidence in her ability to succeed that is key to maintaining healthy eating behaviors.⁹

Case #2 – “I’m hungry all the time – I can’t stand it! I’m thinking about food constantly! I’m ready to give up!”

Carol is a 54 year old woman diagnosed with Type 2 diabetes 5 years ago. She was referred to CR following a myocardial infarction (MI) and subsequent angioplasty. Her medications for diabetes management included both metformin 1000 mg twice daily and diamicron 30 mg. Carol’s usual body weight is 100 kg (220 lbs). Carol lost 23 lbs prior to starting CR. Her initial goal was to reach a target

weight of 72.7 kg (160 lbs). Carol reported a need for structure and acquired an iPhone application to closely track her caloric intake throughout the day. At her initial visit with a RD, the findings from a nutritional assessment revealed that Carol was making healthy food choices by increasing dietary fibre and eating balanced meals. She had eliminated desserts from her diet and reported reducing her portions. She was gradually losing weight. After three months, Carol discontinued diamicron as insulin sensitivity improved with exercise and better eating habits (See Table 2).

During a follow-up visit with the RD, Carol appeared very anxious. She had lost a total of 49 lbs and was frustrated at not losing additional weight. She complained of “constant hunger” and reported experiencing a heightened craving for sweets. A diet analysis revealed that Carol’s recent daily consumption

Table 2: Case # 2 Carol

	Baseline CPA Results & Measurements	3 month CPA	6 month CPA
VO ₂ (ml O ₂)	13.9	21.9	23.9
RHR (beats/min)	104	99	79
BP (mmHg)	109/80	108/60	108/74
Weight	89.5 kg (197 lbs)	78.2 kg (172 lbs)	74.1 kg (163 lbs)
BMI	35	31	29
%BF	45	39	38
WC (cm)	110	104.5	99
A1c	0.069 (Feb. 6, 2012)		0.061 (July 24, 2012)

was approximately 950 calories versus her calculated daily energy requirements of 1600 calories. Carol restricted her food intake in order to achieve her target weight, despite compromising her health.

Practice Points

Carol ignored her internal cue (for the purpose of losing weight) of feeling uncomfortably hungry, which resulted in agitation and self-doubt. A weight-centred approach often de-motivates patients when goal weight is not reached. This often leads to restrictive eating, weight cycling and can result in body image issues, disordered eating patterns and poor nutrition.¹⁰ In reality, hormonal adaptations occur where leptin, a satiety hormone, is decreased and ghrelin, an appetite hormone, increases, making it difficult for individuals to sustain weight loss or reach their target weight.¹¹ Lack of motivation or willpower is frequently cited as the reason for weight loss failure; however, hormones play a key role. Furthermore, weight fluctuations can increase the risk of gallbladder disease and metabolic syndrome; in the latter, weight regain leads to deposition of visceral adipose tissue, which promotes inflammatory conditions such as heart disease and diabetes.^{10, 12}

HAES® guides people to recognize internal signals related to hunger and satiety instead of relying on external cues (e.g., counting calories). Carol would

be considered a ‘success’ story in CR, however, she expressed feeling “terrified of regaining weight.” By focusing on overall health, independent of weight, HAES® encourages self-discovery and reflection for patients that can lead to lasting empowerment and increased self-efficacy.

Future Directions

As clinicians, our role is to promote healthy lifestyle practices for the purpose of achieving health and well being. These two case studies illustrate how patients can achieve better health without striving for an “ideal” weight, as defined by Body Mass Index or waist circumference. Engaging patients in healthy lifestyle practices is more important than addressing body size or shape. According to Dr. Arya Sharma, Professor of Medicine and Chair for Obesity Research & Management at the University of Alberta, “we currently have no evidence to support the notion that otherwise healthy overweight or moderately obese individuals will indeed experience any health benefits from simply losing weight” (<http://www.drsharma.ca/preventing-weight-gain-is-the-first-step-in-obesity-management.html>).

Evidence reveals that healthy eating and exercise can result in positive health outcomes even in the absence of weight loss.^{8,13} Implementing HAES® in CR can help foster positive, authentic and trusting client-clinician relationships that lead to sustained changes in behaviour and improved metabolic parameters. Assisting patients to be healthy in mind, body and spirit requires a shift away from the current health paradigm that focuses on weight.

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Program Profile

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The Women’s Cardiovascular Health Initiative: “Young hearts at the forefront”

Introduction

Cardiovascular disease (CVD) is the number one killer of women in Canada.¹ Once women develop CVD they typically fare worse than their male counterparts.² Cardiac rehabilitation (CR) has been shown to be an effective intervention for both men and women and is considered an essential component of care for all patients with CVD.^{1,3} Women face a number of barriers to exercise program participation, including

family and work responsibilities, program cost, lack of transportation, social support, co-morbidities, and/or fear of injury.⁴⁻⁶ Compounding the effect of these barriers is the fact that women are less likely to be referred, enroll in or complete a CR program than men.^{4,7} In 1995, Women’s College Hospital (WCH) created the Women’s Cardiovascular Health Initiative (WCHI) a “women only” CR program.^{8,9} Consideration of gender-specific variables when designing and implementing CR and Primary programs has led to improved access to cardiac care and addressing unique barriers that women face.

Feeling physically, socially, and symbolically safe in one's CR environment may contribute to program adherence and exercise maintenance for women.¹⁰

Young but troubled hearts

The WCHI has recently seen an increase in referrals for younger women living with heart conditions. While the rise of diabetes, sedentary lifestyles and obesity increases the risk of atherosclerotic CVD in younger women, many women (<40 years) have presented with non-atherosclerotic cardiac conditions diagnosed during or immediately following pregnancy. Our cohort of younger women have presented primarily with: post partum left anterior descending (LAD) dissections, congenital heart conditions, post-partum cardiomyopathy (PPC), and gestational diabetes mellitus (GDM).

Special assessment and treatment considerations

While our younger cohort present with a variety of diagnoses at referral, they discussed different issues and concerns compared to traditional middle-aged female cardiac patients. Many of these women have young children and are starting careers or attending postgraduate studies. With a commitment to the philosophy of women-centered care a decision was made at the WCHI to focus our efforts on new programs and support for this group of women.

During intake assessment, more thorough questioning regarding lifestyle in addition to their cardiac condition is relevant for designing a treatment plan, such as; post partum incontinence; breast feeding (i.e., medication and nutrition considerations); and fatigue and sleep related concerns due to the demands as a new mother. The physiotherapist has had to perform more in depth assessment of thoracic spine and rib cage mobility in young women post-surgery to help identify causes of "chest discomfort." Exercise-specific training considerations include: assessment of diastasis rectus separation and impact on core training, proper lifting techniques, and pelvic floor training, including the young child where appropriate.

Through goal setting strategies for this cohort we have identified a number of unique barriers related to self-perception. For example, one woman was told all her life not to over exert herself because of her congenital heart condition. She never thought or dreamt of herself as an exerciser and was almost in tears at the thought of being able to learn to run with proper training and progression. GDM has presented another unique set of challenges. Although 20% of women with previous GDM develop diabetes within nine years after delivery,¹¹ women's perception of their risk is generally low, requiring awareness and education regarding future risk of diabetes and risk factor management.

From a treatment perspective, our program staff has researched specific community resources to help

transition these women into community exercise programs, for example, mommy and baby fitness groups, stroller walking programs and exercise facilities that offer child care. We also modified our program to allow for more flexible service delivery – providing a safe space for children during their CR class (if they didn't have child care), flexible home program options (appreciating children's nap time and patient's school schedule), and flexible times for exercise classes (early morning, lunch and evening classes). Special focus has also been considered in nutrition counseling such as weight loss and breastfeeding and providing resources and support to improve sleep hygiene.

Support Group for Young Women

After hearing similar concerns from this group of women, our team offered to develop and facilitate a unique support group that would effectively allow women to connect and share their similar lived experiences. This group provides ongoing support and assistance with problem-solving and identification of resources to supplement their regular exercise and heart health education classes. Many of the participants concerns have been related to stressors of living with a heart condition (a concern common to all patients with cardiac disease), but also to unique stresses of raising young children, interruption in their careers or schooling due to health, and managing their diverse roles. There are some general themes that have come through in these discussions; increased anxiety regarding health, differentiating between adverse cardiac symptoms and panic attacks, the change of roles – adjustment to a 'new normal', work and family balance with self care and health care needs, how to introduce activities in a safe way (for example, sexual activity when living with poor ventricular function), dealing with the rollercoaster of emotions – sadness, depression, anger, fear, guilt and "when will I feel normal again?" and dealing with thoughts of "why me?" Some women have voiced feelings of "invisibility" of their heart condition⁶⁻⁸ weeks post-event. They report great support and help after their event or surgery, but once they start to feel and look healthier, some have felt the support from their partners, family and friends "disappeared."

Summary & Conclusion

Young women with congenital heart disease and other less common forms of heart disease (e.g., PPC) have been identified by CACRC as a population where access to CR remains low and further research is required. Furthermore, the literature reports that younger women in general are less likely to be referred to and attend CR.¹² Our program coordinators have become advocates for many women in this group, assisting them in obtaining referrals to our program or other services. In the WCHI program setting, these young women have benefited from both exercise and

education offered in a women-only format. They have benefited from improvements in exercise capacity, laboratory values, anthropometric measurements, self-confidence and behaviour change. The recently developed Young Women's Support Group has proved anecdotally useful as women have elected to continue to attend even after finishing their exercise and education sessions.

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Recognizing Cleo Cyr

The Heart and Stroke Foundation of New Brunswick



In photo: Glen Hicks, Board President of the HSFNB and Cleo Cyr, recipient of the Diamond Jubilee Award.

Congratulations to Cleo Cyr for her Diamond Jubilee award that was presented to her in February! The Heart and Stroke Foundation of New Brunswick was honored to present Cleo with this very honorable and distinguished award to thank her for her countless volunteer hours, working tirelessly to serve her community, in addition to encouraging and initiating activities that strengthen our New Brunswick health system.

They recognized that the work Cleo has provided has engaged many others along the way, and working

with her collectively has created momentum in our province that is thriving, vibrant, and creative and has been dedicated to reducing the burden of cardiovascular disease.

Cleo is an extremely dedicated nurse who has shared her knowledge in volunteer work with numerous organizations, at a local, regional and a national level over her forty year career. Her focus the past twenty-five years has been geared towards cardiac care and rehabilitation, and she has been involved with countless organizations as a speaker, moderator, researcher, author and of course, a mentor. She has been awarded many times including the Award for Advanced Learning Distinction, Alumni Award of Distinction, The Canadian Association of Cardiac Rehabilitation Award of Distinction, Vocational Excellence and high Ethical Standards Distinction and many more. Congratulations Cleo! From the Heart and Stroke Foundation of New Brunswick Board, staff, your family and friends for your invaluable contribution to this province and our foundation!

ICCPR Statement – “What it means to be part of an International Collaboration”



AUSTRALIA

The Executive Management Committee of the Australian Cardiovascular Health and Rehabilitation Association (ACRA) recognises the potential for global communication and collaboration for cardiovascular prevention and rehabilitation. We look forward to engaging in structured strategy and the development of achievable outcomes to aid practitioners, consumers and the prevention of cardiovascular disease.

Sindy Millington, ACRA President



BRAZIL

On behalf of the Brazilian group of Cardiopulmonary and Metabolic Rehabilitation, which is part of the Brazilian Society of Cardiology, I express my satisfaction and hope for the opportunity to participate in an international strategy to promote cardiac rehabilitation, something of fundamental importance to public health. In this context, I think of great importance to creating an official group of the World Heart Federation, with the possibility of participation of representatives from countries around the world, where there are cardiac rehabilitation programs. Finally, I take this opportunity to offer you my sincere congratulations for the initiative.

Dr. Tales de Carvalho, President of the Brazilian Group of Cardiopulmonary and Metabolic Rehabilitation



CANADA

The Canadian Association of Cardiac Rehabilitation is delighted to be part of this collaboration with other national cardiac rehabilitation societies. Through the successful formation of an International Council, early efforts of this collaborative group have focused on cardiac rehabilitation ‘messaging’ and the desire to improve access to cardiac rehabilitation services, creating new synergies between national societies. The official publication of the ICCPR Charter was

published in our Association Journal, JCRP this past spring. We supported the ICCPR as it moved forward in its now formalized capacity, sharing knowledge and expertise for the greater health of all communities affected by cardiovascular disease.

Dr. Bob Reid, President CACR



CUBA

All over the world there has been a large increase in morbidity and mortality attributable to cardiovascular diseases, with a particular emphasis in coronary diseases. There are several cardiac rehabilitation and secondary prevention evidence-based guidelines, nevertheless reference, incorporation, and long-term adherence to such programs are not satisfactory in several countries mainly because of medical, psychological and socio-economic factors. To increase preventive strategies, including cardiac rehabilitation, it becomes necessary for the incorporation of health authorities and the medical community to engage in a preventive strategy. Also, it is of particular importance to incorporate the mass media and school education to increase knowledge of people in relation to prevention and control of risk factors. It is precisely in this point where the International Collaboration can play an important role in the establishment of a plan of action to sensitize government authorities and non-government organizations to implement broad programs for cardiovascular disease prevention and rehabilitation all-over the world.

Dr. Eduardo Rivas-Estany, Cuban Society of Cardiology (CSC) and President, Heart Friends Around The World (HEATW)



INDIA

India is undergoing an epidemic of cardiovascular disease. Besides the emotional burden it places on individuals and their families, the economic consequences are debilitating for a growing economy. An international collaboration will add to our resources as we tackle this global disease. We will certainly benefit from the best practices put in place by other organizations around the world and will contribute to the knowledge base by sharing our

experiences. This collaboration will help to reduce the global burden of this deadly but largely preventable disease. NSPHERE-India is proud to be a part of this initiative and wishes it all the best of success.

Dr. Aashish Contractor, Governing Council Member, National Society for Prevention of Heart Disease and Rehabilitation (NSPHERE) – INDIA



IRAN

The Isfahan Cardiovascular Research Institute (ICRI) has been established since 1993. It is a WHO collaborating center for Research and Training in Primary Prevention and Rehabilitation of Cardiac patients in the Eastern Mediterranean Region (EMR) and committed to sharing knowledge and experience of cardiovascular disease (CVD) prevention (primary and secondary) and rehabilitation with other countries specifically those in the EMR.

We believe that joining the ICCPR will further assist the ICRI to play a role in a global collaboration to achieve its aims and assist others with similar aims. We also believe that this initiative will assist the implementation of the WHO Global Action Plan for Non-Communicable diseases prevention and Control worldwide.

Prof. Nizal Sarrafzadegan, Director of ICRI



IRELAND

As a national Cardiac Rehabilitation association dedicated to promoting Cardiac Rehabilitation and secondary prevention of Cardiovascular Disease, being part of the ICCPR brings global strength to our aim of ensuring equitable and fair access to Cardiac Rehabilitation and secondary prevention strategies for all. It also provides us with an international platform by which to explore opportunities for best practice, in partnership with like-minded experts working in CV care. This will ultimately ensure that we continue to promote and develop effective evidence-based strategies and initiatives for Cardiovascular Disease prevention and Rehabilitation.

Roisin Duffy, President LACR



SAUDI ARABIA

We recently created the Saudi group for CV prevention and rehabilitation under the Auspices of the Saudi

Heart Association. We believe this will bring hand and mind together from different multidisciplinary specialties to achieve our goal for our cardiovascular patients to receive this service as essential and integral therapies in the management of this disease in an area, which is crucially deficient in Saudi Arabia. Joining the ICCPR will further assure our goal by adding different international experiences and opinions and through this international group, we can share experience and help other parts of the world who lack this service intellectually and physically to achieve the same goal as one globe with one heart.

Dr. Najeeb Jaha, Saudi Heart Association Cardiovascular Prevention and Rehabilitation Group



UNITED KINGDOM

The British Association for Cardiovascular Prevention and Rehabilitation (BACPR) is committed to the cause of sharing experiences, knowledge, research, standards and evidence-based guidelines in preventing the causes of cardiovascular disease (CVD), and in providing rehabilitation and secondary prevention programmes to those living with the burden of CVD. To be part of an international collaborative provides the opportunity to help others who have not yet had the good fortune to fully establish quality prevention and rehabilitation programmes in their own country. BACPR is honoured to be involved in an initiative that aims to promote and develop excellence in cardiovascular disease prevention and rehabilitation around the globe.

Jenni Jones, BACPR President



UNITED STATES of AMERICA

The American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR) is an organization dedicated to reducing morbidity, mortality and disability from cardiovascular disease (CVD), and improving quality of life for CVD patients and their families. AACVPR enthusiastically supports the efforts of the International Charter on Cardiovascular Prevention and Rehabilitation to increase both the accessibility and utilization of cardiac prevention and rehabilitation services. By combining resources, experiences and research related to primary and secondary prevention of cardiovascular disease from around the globe, the most effective program delivery and behavior

change models can be established and shared in areas where programs are being newly established. Partnering in the review of data from our collective programs and registries will further enhance the evidence base supporting substantial benefit of preventive and rehabilitative services. By joining

together in these efforts on a global basis, we have the potential to positively impact the future health of those with CVD and to halt the growing numbers of CVD patients worldwide.

Prof. Steven W. Lichtman, AACVPR President

BACPR and CACR Representatives Attend International Development Meetings in Paris

News from the International Council of Cardiovascular Prevention and Rehabilitation (ICCPR)

ICCPR Chair Dr. John Buckley (BACPR) and ICCPR Secretary-Treasurer Dr. Sherry Grace (CACR) attended meetings in Paris on the 11th and 12th of January, 2013, with board members from the European Association of Cardiovascular Prevention and Rehabilitation (EACPR), the World Heart Federation (WHF) CEO, and the World Health Organization (WHO) head of Non-Communicable Diseases. The aim was to discuss a Global Forum on cardiovascular disease in conjunction with the EuroPrevent meeting scheduled for April this year in Rome. Discussion was based around developing an action plan for the WHO's 25 by 25 goal – to reduce premature deaths from non-communicable diseases by 25% by the year 2025. The ICCPR will be teleconferencing with the President of EACPR and the Chair of their Reach Out Task Force to discuss development of an action plan and how the ICCPR can contribute in the area of secondary prevention and cardiac rehabilitation (CR).

Dr. Buckley and Dr. Grace also had opportunities to meet with the EACPR nuclei groups in CR and sports cardiology to explore ways of working together in the future.

The ICCPR International Charter has now been accepted for publication in the Journal of Cardiopulmonary Rehabilitation and Prevention.

In December 2012, the ICCPR Council was officially formed with the initial coming together of 13 cardiovascular prevention and rehabilitation associations from around the world.

They have set out a terms-of-reference, and elected an executive committee: Chair, Secretary and Vice-Chair. Dr. John Buckley (Chair) and Dr. Sherry Grace (Secretary) are joined by Vice-

Chair, Dr. Aashish Contractor, who represents India's National Society for the Prevention of Heart Disease and Rehabilitation. Many BACPR members will know Aashish Contractor who has presented at BACPR and British Cardiac Society Conferences on considerations for South Asians in CR. He also holds the accolade of being the personal rehabilitation physician to the Prime Minister of India.

To get the ICCPR going, each member Association has agreed to pay a relatively small membership fee (\$200 US Dollars) to cover the cost of teleconferences and the fee required to establish themselves as an official sub-group of the WHF.

The ICCPR is putting plans together to host a symposium at the 2014 World Congress of Cardiology in Melbourne, Australia. The focus of this symposium will be promotion and adoption of cardiovascular prevention and rehabilitation programs in low and middle-income countries.



Dr. John Buckley (BACPR), Chair of the ICCPR & Dr. Sherry Grace (CACR) Secretary-Treasurer take a short break from the international meetings in Paris.

ICCPR - April Update

World Heart Federation has accepted the application of the ICCPR in principle, to become an official member association. The ICCPR was invited to speak at a Global Forum on Cardiovascular Disease Prevention in Clinical Practice in conjunction with the EuroPREvent Congress in Rome this past April. In addition to the recent addition of the Chinese Association of CR to the ICCPR Council, the Russian and

Japanese societies have also expressed interest in joining. Formal proceedings, outlining efforts to meet the WHO goal of reducing premature mortality from cardiovascular among other non-communicable diseases by 2025, will be shared with the CACR Board for consideration. Finally, through funding support from the Canadian Institutes of Health Research, the ICCPR is embarking on a collaborative research planning process. For more information, please contact ICCPR Secretary Sherry Grace at sgrace@yorku.ca.



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Exploring the Cardiac Toxicity of Cancer Treatment in Women with Early-Stage Breast Cancer

Amanda S. Manoharan, Candidate for BSc. (Hon)¹; Christine Brezden-Masley, MD, PhD, FRCPC^{1,2}; ¹St. Michael's Hospital, & ²University of Toronto; Toronto, Ontario

Breast carcinoma has been identified as the most prevalent non-melanoma associated cancer and second leading cause of death among women in North America.^{1,2} On a global scale, a staggering 458,400 mortalities were linked to breast cancer in 2011.¹ Fortunately, improved diagnostic techniques and systemic treatments have collectively reduced the extent of mortality.¹ Although tumor grade, hormone receptor status, and human epidermal growth factor receptor² (HER²) status are factors that influence survival, the overall 5-year relative survival rate for female breast cancer patients has increased.³ Primary intervention involving the surgical removal of the cancerous lesion from breast tissue followed by adjuvant systemic therapy (ACT), radiotherapy and/or anti-estrogen therapy is standard clinical

practice.² By effectively screening patients for breast cancer and adhering to treatment regimens, this produces positive clinical outcomes.

Following the surgical removal of cancerous lesions from the breast tissue, adjuvant radiation therapy minimizes local recurrence by 66%.⁴ However, studies have revealed concern over radiation therapy due to the increased risk of ischemic heart disease. Advances in the development of computed tomography-based technology has helped guide radiation treatment plans in order to account for anatomical differences between patients.⁵ Studies have concluded that patients diagnosed with left-sided breast cancer and treated with radiation, experience an increased risk of radiation exposure leading to cardiovascular mortality in comparison

to right-sided breast cancer patients.⁴ Recent data suggest that modern techniques developed to quantify the risk of cardiac toxicity is complicated due to the asymptomatic interval from moment of radiation exposure to the onset of cardiac toxicity. However, a minimum 10-year follow-up period is needed in order to obtain valid results.^{6,7} For example, deep inspiration breath hold technique (DIBH) has improved the delivery of radiation treatment with cardiac toxicity.⁶ In this technique, the radiation dose received by the heart is reduced by displacing the breast and chest wall away from the heart during treatment. Adapting the DIBH technique while delivering treatment to the left breast reduces both the irradiated heart volume and dose to the heart leading to potential decrease in cardiotoxicity.⁶ In the future, varying the dose of cardiac radiation received by left-sided and right-sided cancer patients will provide researchers the ability to predict the risk of cardiac mortality due to radiation.

Chemotherapeutic agents such as anthracyclines are linked to cardiovascular toxicity, specifically left ventricular dysfunction (LVD).^{2,8,9} More specifically, research demonstrates that administering anthracyclines post-operatively significantly improves both disease-free survival and overall survival (OS).¹⁰ Although some anthracycline therapies exhibit more favourable clinical outcomes than other ACT, breast cancer recurrence was reduced by 33% and the odds of mortality by 26% when assessing all anthracycline treatment against no chemotherapy.¹⁰ In patients undergoing doxorubicin treatment, the maximum lifetime dose was limited to less than 450 mg/m² due to the risk of LVD.⁸ Although the therapeutic mechanism by which anthracyclines cause LVD is unknown, a proposed theory supporting the pathophysiologic mechanism has been drawn to oxidative stress from the formation of free radicals leading to DNA damage.⁹ Acute, early-onset chronic, and late-onset chronic are the categories of anthracycline-induced cardiac toxicity which reflect the time frame of cardiac toxicity onset in relation to the administration of chemotherapy. A transient decline in left ventricular ejection fraction (LVEF) occurs in less than 1% of patients and is a common result after an anthracycline is given. This is frequently reversible within weeks upon discontinuation of the anthracycline infusion. Some side effects may include tachyarrhythmias (supraventricular or ventricular), bradyarrhythmias (heart block),

myocardial ischemia, dilation of the left ventricle, and seldom cases of myocarditis and pericarditis.⁹

The purpose of the OVERCOME trial (Prevention of Left Ventricular Dysfunction With Enalapril and Carvedilol in Patients Submitted to Intensive Chemotherapy for the Treatment of Malignant Hemopathies) aimed to gain a better understanding of patients diagnosed with cancer globally who succumb to cardiotoxic effects.

The sample recruited in the OVERCOME trial was comprised of 90 patients of which 36 had recently been diagnosed with acute leukemia and 54 were undergoing autologous hematopoietic stem cell transplantation (22 with multiple myeloma, 23 with Hodgkin's lymphoma, and 9 with non-Hodgkin's lymphoma).¹¹ All patients received intensive high-dose chemotherapy treatments. Anthracyclines which are cardiotoxic in nature were given to patients diagnosed with acute leukemia. The distribution of patients in the intervention group (enalapril plus carvedilol; n = 45) and the control group (no cardiovascular drugs; n = 45) were randomly assigned. LVEF was measured before and after chemotherapy using cardiac magnetic resonance (CMR) imaging and echocardiography. Following 6 months from baseline, LVEF did not change in the intervention group, but it had decreased significantly in the control group. By using echocardiography as a modality to monitor LVEF, the absolute difference was -3.1% (P = .035); with CMR, it was -3.4% (P = .09). Although enalapril plus carvedilol presented with a significant protective effect, this outcome was observed in the subgroup of 36 patients with acute leukemia who received the more cardiotoxic chemotherapy regimen. It is therefore common for ACE inhibitors or beta blockers to be used for chemotherapy-induced cardiac disease, even while on ACT or after.

Emerging biological therapies involving the development of antitumor agents has revolutionized cancer treatment. Prognostic factors involving tumour size, hormone-receptor status, and axillary-node status identified in a patient facilitate the treatment option.¹² Nearly 18-25% of breast cancer patients express tumours containing a transmembrane protein receptor called HER2 (erbB2) which plays a pivotal role in controlling cell proliferation.^{2,12} Clinical trials have identified an anti-HER2 monoclonal antibody, Trastuzumab (Herceptin) which is a targeted therapy that reduces disease recurrence by 50% in addition to approximately 30% reduction

in all-cause mortality in the adjuvant setting.¹³ Trastuzumab has been acclaimed as the global standard in clinical practice among HER2 positive breast cancer patients. Although the mechanism of trastuzumab action is not clearly understood, earlier studies point towards the role of HER2 signalling in cardiogenesis and adapting to stress.¹⁴ Consequently, when trastuzumab blocks this pathway, cardiac damages may arise contributing to ultrastructural changes, functional impairment and heart failure (HF). In contrast to trastuzumab improving disease-free survival among breast cancer patients with HER2 overexpression, the concern surrounding cardiac toxicity has been raised as a potentially significant complication. In one of the pivotal trials, the National Surgical Adjuvant Breast and Bowel Project (NSABP B31) Phase III adjuvant trial comprised of 3,000 patients who received trastuzumab treatment, cardiac dysfunction (CD) was assessed. Approaching the end of 7 years of follow-up, cardiac events (CE) were reported in 37 (4.0%) out of 944 patients treated with trastuzumab versus ten (1.3%) out of 743 patients enrolled in the control group.^{11,15} Furthermore, radiation treatment concurrently with trastuzumab has raised concern over adverse events (AEs) including cardiac toxicity.⁷ In the NSABP B31 trial, radiation treatment was administered in conjunction with trastuzumab post chemotherapy. It was concluded that concurrent radiation treatment with adjuvant trastuzumab did not increase radiotherapy-related acute AEs or cardiac events (CEs) aside from leucopenia. Therefore, radiotherapy in addition to trastuzumab can be continued.⁷

By instituting careful surveillance of LVEF and monitoring patients with LVEF <50%, physicians will be able to consult breast cancer patients and initiate cardioprotective medication promptly. Currently, serial multiple-gated acquisition (MUGA) scans or 2Dimensional echocardiography (2D Echo) serve as the current practice in monitoring cardiac function during the course of trastuzumab therapy. CMR has the ability to accurately depict cardiac performance with high level resolution, and has surfaced as the new gold standard for the non-invasive assessment of LVEF. Additionally, troponins which are classified as cardiac biomarkers have demonstrated sensitivity and specificity in accurately identifying cardiac toxicity as a result of high dose chemotherapy.¹⁵ Myocardial cells

express troponin I (TnI). The pattern of TnI plasma concentration predicts myocardial injury. In patients receiving high dose chemotherapy, elevated TnI carefully predicts LVEF.^{16,17} The severity of LVEF was revealed in studies involving patients with HF who reported increased brain natriuretic peptide (BNP) secretion from ventricles. In the Breathing Not Properly Multinational Study comprised of 1,586 patients, the role of BNP measurement in a clinical setting was valuable as patients diagnosed with HF expressed higher BNP levels.¹⁸

Novel targets in cancer therapy are evolving complemented by the improved delivery of radiation treatment. For example, the development of antibody-drug conjugates (ADCs) was designed to target action towards antigen-expressing cells.¹⁹ The standard components of an ADC are the cytotoxic agent, a monoclonal antibody targeting a tumor-enriched or tumor-specific antigen, and a linker that covalently binds these components together. Trastuzumab-MCC-DM1 (T-DM1) is an innovative ADC that uses trastuzumab to specifically target HER2-expressing cells and has shown significant promise in HER2 positive breast cancer.¹⁹ Other small molecule tyrosine kinase inhibitors (TKIs) have also demonstrated significant benefit in advanced breast cancer and may be moving to early breast cancer therapy. These TKIs, in general, can also lead to cardiac changes. Therefore, it is crucial to begin understanding the potential mechanisms of cardiac damage from breast cancer therapy in order to ensure that women surviving from breast cancer do not suffer from preventable cardiac complications from curative therapy.

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From the Office

Stacey Grocholski, Executive Director

Spring is finally here and we look forward to refreshed and new beginnings at CACR. The re-brand project is underway and options for a new name will be presented to the membership shortly for your vote. It's your time to give us feedback and help shape the future of CACR. In conjunction with the re-brand, we will be reaching out to key stakeholders and asking strategic questions allowing us to better understand the needs and wants of our members and prospective new members. Watch out for more information and results of the survey coming soon!

Another important initiative CACR is working on are revisions to existing CACR By-laws to reflect recent changes to the Canada Not-for-profit Corporations Act. All federally incorporated Not-for-profits must comply with the new regulations by October 2014. The new Act is more flexible and allows for greater transparency. A task force was set up earlier this

year and we have been working with legal counsel to ensure our interpretation of the regulations are consistent with our revised By-laws.

Member consultation is an important next step in the process. Communication will be sent out shortly and it will be your opportunity to provide feedback, comments and ask questions. The goal is to approve the revised By-laws and Articles of Continuance (replaces the Letters Patent) at the Annual General Meeting in October of this year.

On this note, I look forward to seeing everyone at the Annual Conference & Symposium. We have a great program lined up and as part of Vascular 2013, it will be even more exciting to attend and take advantage of all the educational sessions and networking opportunities under one roof! Registration opens in June and I encourage you to register under CACR. I look forward to meeting more of you and having a great few days in Montreal.

At CACR, it is our goal to provide relevant learning opportunities like the annual conference and educational publications that speak to all of us in the cardiac rehabilitation field. To enable CACR to continue offering these products, membership fees will increase as of June 1st, 2013.

Thank-you to those members who have already renewed for 2013.

Membership fees will increase to the following:

Regular	\$150
Associate	\$150
Student	\$65
Retired	\$60
International	\$180

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BACK TO THE FUTURE Advances in Cardiovascular Prevention and Rehabilitation

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Your 2013 conference sessions will include:

- Dr Hugh Bethell: Galloping cardiac rehabilitation – the past, present and future
- Professor Huon Gray (Interim National Clinical Director for Cardiovascular Disease) speaking on the new "CVD Outcomes Strategy"
- Professor Joep Perk: Moving with the evidence - advancing practice through the latest clinical guidelines
- Dr Damien Edwards: Behavioural theory of communication 'Mars Vs Venus'
- Dr Chris Pepper: Advances in atrial fibrillation and devices
- Dr Mike Fisher: Managing stable angina
- Special highlight session on technology in cardiac rehabilitation
- Special CRIGS (Cardiac Rehabilitation Interest Group Scotland) session
- Parallel sessions
- Celebrating 20 years gala dinner

And much much more!



Call for Abstracts 2013 Annual Conference

Abstracts are invited for submission no later than 1st July 2013 for oral or poster presentation. Abstracts giving details of research or innovation in cardiac prevention and rehabilitation will be considered for oral presentation in the breakout sessions. Submissions on the topic of 'Advances in Cardiovascular Prevention and Rehabilitation' will be particularly welcome.

Abstracts should:

- Be submitted by email to bacpr@bcs.com. Please send as a .doc attachment
- Be no more than 250 words in length
- Be in word format using 12 point size Arial font
- Have a title in capital letters, and the organization involved
- The name(s) of the author(s) must be preceded by initials only
- Omit titles and degrees and underline only the main presenter
- Add full postal address and email address of the main presenter at the end

Please indicate your preferred form of presentation; oral or poster. The best abstracts accepted as a poster will be invited to present their poster in a moderated session. There will be prize plaques for best abstract accepted for oral presentation and for best moderated poster.

If you have not received an email confirmation of receipt from the BACPR co-ordinator within 10 working days of submission, please re-submit abstract or call 0207 380 1919.

Conference registration is mandatory for any format of presentation.

This issue of CICRP has been a cooperative effort between the following associations:

Canadian Association of Cardiac Rehabilitation
British Association for Cardiovascular Prevention and Rehabilitation

