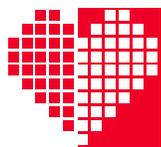


CARDIAC CARE NETWORK



Standards for the Provision of Cardiovascular Rehabilitation in Ontario

September 2014





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This document has been developed by the Cardiac Care Network of Ontario - Cardiovascular Chronic Disease Management Working Group (2014).

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Introduction

The Cardiac Care Network of Ontario (CCN) serves as a system support to the Ministry of Health and Long-Term Care (MOHLTC), Local Health Integration Networks (LHIN) and service providers and is dedicated to improving quality, efficiency, access, and equality in the delivery of adult cardiovascular services in Ontario.

The CCN, in collaboration with members of the CCN-Cardiovascular Chronic Disease Management Working Group convened a committee, known as the CCN-CR Standards Writing Committee, for the purposes of developing standards for the provision of cardiovascular rehabilitation (CR) in Ontario. This subcommittee was Chaired by Dr. Paul Oh (Toronto, Ontario) and members included key stakeholders in the delivery of CR in Ontario.

A number of strategies were used to inform the development of the standards by the CCN-CR Standards Writing Committee. These standards were based on the guidelines published by the Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) (formerly known as Canadian Association of Cardiac Rehabilitation or CACR), Canadian Cardiovascular Society- CR Quality Indicators, and where relevant, to include guidelines by other professional groups and organizations. Several of the risk factors that contribute to cardiovascular disease are common amongst many of the chronic illness that Ontarians are living with and therefore recommendations from the Chronic Disease Management model (MOHLTC, 2007) were used to inform the development of these standards. The CCN also invited members of the Cardiac Rehabilitation Network of Ontario (CRNO) and CR clinicians and administrators from across the province to participate in a workshop held on June 13, 2014 to share expertise to inform the development of these standards. In addition, the final draft of this document was reviewed by a panel of CR experts from across Canada who also provided comments and feedback.

On behalf of the CCN, I would like to thank Dr. Paul Oh and the members of the CCN-CR Standards Writing Committee for their clinical expertise and countless hours contributed to this important initiative. We look forward to continuing to work with key stakeholders on the implementation of these standards and recommendations for the delivery of cardiovascular rehabilitation in Ontario.

Kori Kingsbury
Chief Executive Officer
Cardiac Care Network of Ontario

Dear Colleagues and Readers,

As a community of highly engaged cardiovascular rehab professionals in Ontario, we are all impressed with the strong evidence base for cardiovascular rehab – namely longer and better life! We are also thoroughly committed to ensuring the quality of the programs that we work in. When we launched this process under the auspices of CCN at the beginning of 2014, there was therefore great enthusiasm and strong endorsement to develop and articulate standards for best practice in this area of cardiovascular rehab and prevention.

On behalf of the working and writing groups, we are so pleased to be able to bring this standards document to you. Many talented professional volunteers contributed hundreds of valuable hours over the last several months to very thoughtful idea generation, lively discussion and debate, and then careful writing and editing to arrive at this outstanding final document.

We are very grateful to the Cardiac Care Network for acknowledging and promoting the importance of systematic prevention and rehab programs as a core component of the cardiovascular care continuum and as an excellent model of chronic disease management in the province of Ontario. We hope that this document will help the cardiovascular rehab community in identifying opportunities for further clinical and research collaboration and spur on the further adoption of these high quality programs for patients in need with cardiovascular and other chronic health conditions.

Respectfully,

Paul Oh, MD MSc FRCPC
Medical Director
University Health Network
Cardiovascular Prevention and Rehabilitation Program



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Standards for the Provision of Cardiovascular Rehabilitation in Ontario

Cardiovascular rehabilitation (CR) is an important specialized component of chronic cardiovascular disease care and chronic disease management that uses a multifaceted approach that includes: reducing cardiovascular risk factors, using behaviour modification strategies to sustain healthy lifestyles and promote pharmacological adherence, and providing therapeutic exercise training (Arthur, 2010; Canadian Heart Health Action Plan 2009). While a dose-response relationship between CR program attendance and reduced mortality and morbidity has been established (Hamill, 2010; Martin, 2012), there is overwhelming evidence indicating that participation in CR improves the quality of life and decreases morbidity and mortality in people with cardiovascular disease (Heran, 2011; Lawler, 2011). Cardiovascular risk factor reduction through participation in a CR program for people who are at a high risk for future cardiovascular events is also beneficial (CDA, 2013; Dasgupta, 2014; Schuler, 2013).

Clinical guidelines support the need for CR to optimize recovery for patients following a cardiac event (Armstrong, 2004; Grace 2011a). Furthermore, CR is considered an essential component of cardiac care that addresses integration and patient-centred health domains of Cardiac Quality Based Procedures (QBP) in Ontario (www.health.gov.on.ca). Referral to CR for all eligible patients post cardiac procedure is recommended within the QBP clinical pathways before hospital discharge.

Although the CACPR has published clinical guidelines, to date, there are no published standards for the delivery of CR in Canada. The **purpose** of this document is to provide a comprehensive definition of minimal requirements for evidence-based CR outpatient services in Ontario.

The standards outlined in this document aim to reduce current variation in care whilst ensuring current and future CR programs are clinically effective, cost-effective and achieve sustainable health outcomes for patients. These standards provide a general framework for which health care providers may expand and remodel in response to their local program delivery model, resources, local environment and the needs of their community and target population.

Meeting these standards may be achieved through a number of strategies such as redesigning or enhancing local CR services, leveraging or strategically aligning with appropriate community partners, or networking with other chronic disease management and prevention programs. Enhanced collaboration will ensure the maximum use of limited resources to improve the health outcomes for patients across several chronic conditions. It is recognized that specialty



rehabilitation programs (for example, cardiac, pulmonary, stroke) provide additional condition-specific interventions; however, there are numerous strategies that represent components of a chronic disease management model (MOHLTC, 2007) and are common across all types of rehabilitation programs.

The following document is considered dynamic in that updates are anticipated as evidence and practice evolves. The CCN-Cardiovascular Chronic Disease Management Working Group, in collaboration with key stakeholders will review the document every two years.

This document is structured in a format that represents the patient journey into chronic disease management from initial eligibility for CR to completing a CR program and transitioning to long-term behaviour change (Figure 1). It will therefore be structured in the following sections:

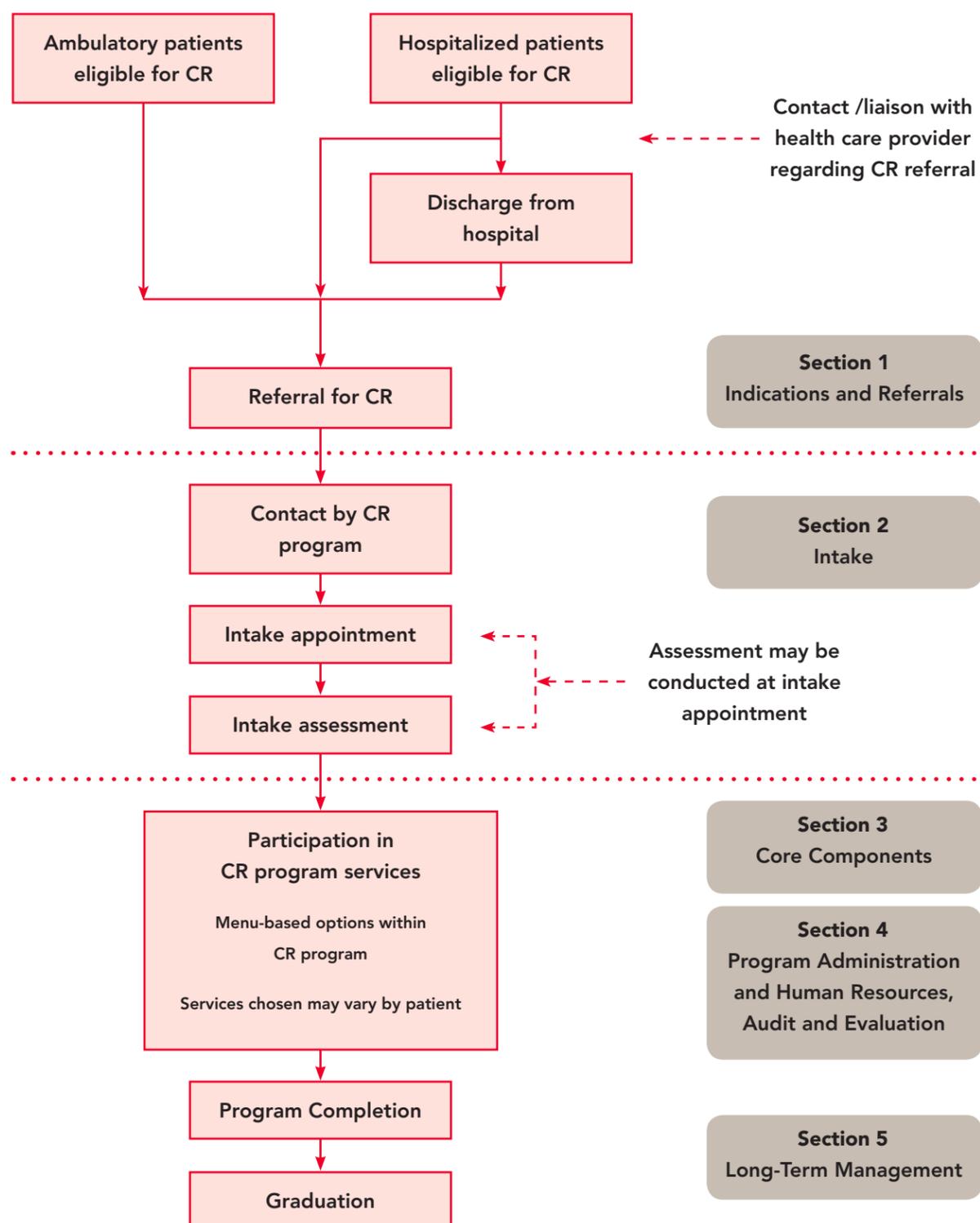
- Section 1.** Indications and Referrals for Cardiovascular Rehabilitation
- Section 2.** Cardiovascular Rehabilitation Intake
- Section 3.** Cardiovascular Rehabilitation Core Components
- Section 4.** Program Administration, Human Resources, Audit and Evaluation
- Section 5.** Long-Term Management

Information to supplement the Standards is located in the Appendices following Section 5. The Appendices are organized in the following sections:

- Appendix A** Abbreviations and Definitions
- Appendix B** Strategies for Health Behaviour Change and Education
- Appendix C** Tips for Designing Individualized Exercise Prescriptions
- Appendix D** Tools for Nutritional Assessment
- Appendix E** Screening Tools for Depression
- Appendix F** Facility and Equipment Considerations
- Appendix G** CCS - Quality Indicators for Cardiac Rehabilitation
- Appendix H** References
- Appendix I** Summary List of Standards

Note: Within this document the term, **shall**, is used to express a requirement that CR programs are obliged to satisfy in order to comply with the standard. The term, **should**, is used to express a recommendation or that which is *advised* but not required.

Figure 1. Cardiovascular Rehabilitation Patient Flow



Section 1:

Indications and Referrals for Cardiovascular Rehabilitation

1.1 Identification, Referral and Recruitment

Indications for Cardiovascular Rehabilitation

It is important to promote a better understanding of outpatient cardiovascular rehabilitation (CR) as a chronic disease management service (Canadian Heart Healthy Action Plan, 2009). This service needs to be cost-effective, interprofessional, and a treatment option for persons with established cardiovascular disease.

Standard 1.1.1: Indications for cardiovascular rehabilitation for persons with established cardiovascular disease shall include:

- Any one of the following diagnoses:
 - Acute coronary syndrome (e.g., ST elevation MI, non-ST elevation MI, or unstable angina)
 - Chronic stable angina
 - Chronic stable heart failure
- Post-procedure such as:
 - Percutaneous coronary or valvular intervention
 - Coronary artery bypass surgery
 - Cardiac valve surgery
 - Cardiac transplantation
 - Ventricular assist device implantation.

Source: CACR guidelines, 2009

Eligible patients for referral to cardiovascular rehabilitation shall include patients with an appropriate diagnosis listed in Standard 1.1.1.

Note: Patients who have not experienced a cardiovascular event but have cardiovascular risk factors (e.g., hypertension, diabetes, hyperlipidemia) and are high risk for future cardiovascular events should also be referred to cardiovascular rehabilitation.

Growing evidence supports a benefit of CR for patients with atrial fibrillation (Giacomantonio, 2013; Lowres, 2012; Prior, 2013; Reed, 2013), peripheral artery disease (Falcone, 2003), or cerebrovascular disease (Prior, 2011), and following cardiac resynchronization therapy (Patwala, 2009). CR programs should be structured to attract and manage a wide spectrum of patient groups with vascular disease that goes beyond the traditionally-served coronary artery disease population, while adhering to current treatment guidelines. Individuals who may not meet the traditional criteria listed in Standard 1.1.1 but have underlying vascular disease should be considered for referral and enrollment in cardiovascular rehabilitation.

Referral for Cardiovascular Rehabilitation

Standard 1.1.2: Referrals for cardiovascular rehabilitation shall be made by a primary care provider or specialist whose role includes caring for the patient.

Standard 1.1.3: A referral for cardiovascular rehabilitation shall be made as an official communication between the referring health care provider, the cardiovascular rehabilitation program and the patient.

Note: All communication shall maintain appropriate confidentiality as outlined by the 2004 Personal Health Information Protection Act (Grace, 2011a).

Recruitment for Cardiovascular Rehabilitation

Standard 1.1.4: Patients referred for cardiovascular rehabilitation shall be contacted by a staff member of the cardiovascular rehabilitation program within 2 weeks of referral to arrange an intake appointment.

Note: Systematic referral to CR supported by a liaison, whereby the referral is facilitated through personal discussion with a health care provider will help to optimize referral to CR (Grace, 2011b). Ideally, in patients who are referred to CR during hospitalization, this discussion should occur prior to hospital discharge. However, recruitment is also improved with early contact from a member of the CR program.

Section 2:

Cardiovascular Rehabilitation Intake

2.1 Initial Assessment of Individual Patient Needs

Intake into CR includes an initial assessment of individual patient needs in each of the core components. A CR program begins when the patient goals have been identified and the action plan has started. Starting rehabilitation within a few weeks of either discharge or diagnosis has been shown to be both safe and feasible (Aamot, 2010; Eder, 2010; Haykowsky, 2011; Maachi, 2007) as well as to improve patient uptake and adherence (Parker, 2011a).

Offering outpatient group education sessions may be an effective approach to mitigate any wait-time delays for individual sessions or a structured exercise program. Furthermore, this approach may:

- Encourage awareness of heart-health promoting behaviours;
- Provide reassurance to patients and family members;
- Verify discharge instructions; and
- Ensure identification of emerging clinical issues such as deterioration in their medical or psychological state (Dafoe, 2006; Grace, 2012; Parker, 2011b).

Standard 2.1.1: All interested patients referred to outpatient cardiovascular rehabilitation shall undergo an intake assessment in a timely fashion so that their rehabilitation program can be initiated, either through an education class or intake session, ideally within one month of referral (Dafoe, 2006). The intake assessment often occurs during the initial appointment, but may also require a follow-up appointment for completion.

Standard 2.1.2: The intake assessment shall include but is not limited to assessment and documentation of the following:

- Demographic information and social determinants of health (e.g., years of education completed, employment/working conditions, social support) including potential barriers to participation and adherence such as financial constraints;
- Medical history, symptoms, and advanced care preferences for future health treatment;
- Cardiovascular risk factors (e.g., hypertension, dyslipidemia, dysglycemia, diet, tobacco use, physical activity and exercise patterns, obesity) including laboratory results (e.g., lipid profile, glucose, HbA1c);



- Clinical enquiry about emotional and psychosocial health status, psychological stress, current and recent alcohol consumption, sleep quality, and specific signs/symptoms of sleep apnea;
- Best possible medication history and reconciliation with emphasis on the use and tolerance of evidence-based cardioprotective therapies and adherence;
- Physical exam focusing on vital signs, anthropometric measurements, cardiovascular, respiratory and neuromusculoskeletal systems as well as procedure-related sites (e.g., puncture site, leg, forearm and/or sternum when applicable); and
- A review of the ECG and where available, cardiac imaging (LVEF) and testing of exercise capacity and ischemic thresholds.

Standard 2.1.3: Patients shall be given written information regarding their personal cardiovascular risk factor profile.

Standard 2.1.4: The intake assessment shall include a patient-centered and comprehensive care plan that prioritizes goals and outlines action strategies for risk reduction. The written care plan shall be available to the patient within one month following the initial assessment.

Standard 2.1.5: An intake letter summarizing the information collected during the intake assessment outlined in Standard 2.1.2, the care plan and goals shall be sent to the patient's identified primary care provider and cardiovascular specialist within one month following completion of the initial assessment.

2.2 Risk Assessment

Standard 2.2.1: A standardized assessment of the patient's risk for an acute cardiovascular complication during exercise shall be completed prior to the initiation of exercise therapy. Risk stratification for exercise shall use relevant patient information (e.g., left ventricular ejection fraction (LVEF), history of arrhythmia, device therapy settings, symptoms, functional capacity) and a validated risk stratification tool. Possible tools include the: Duke Treadmill Score, Cardiometabolic Score, Canadian Cardiovascular Society Angina Classification (CCS), New York Heart Association classification (NYHA) (CACR guidelines, 2009, Chapter 10; Thompson, 2013), and RARE score (Lacombe, 2014).

Note: Risk stratification is a standard assessment of the patient's risk for a cardiovascular complication or clinical event (i.e. fall) during exercise. The purpose of risk stratification is to help guide the exercise prescription and the supervision required.

2.3 Alignment with Patient Preference and Choice

CR should be organized in accordance with the principles of chronic disease care in order to maximize the patient's quality of life, program effectiveness, and long-term management. The elements of the Chronic Care Model (Wagner, 1996) lead to an 'informed, activated' patient and a 'prepared, proactive' practice team, resulting in improved patient outcomes and sustainability of positive health behaviours beyond graduation from the CR program. Included in this model is the need for ongoing assessment and documentation of progress towards goals during the CR program and recommendations for long-term strategies.

Standard 2.3.1: Care planning for cardiovascular rehabilitation shall be based on self-management principles and adult learning principles that incorporate behavioural change concepts.

Standard 2.3.2: The care plan shall be individualized to the patient's needs and goals within each of the core components and align with the patient's preference and choice. A menu-based approach, delivered in accessible venues and times (e.g., mornings and evenings), provides the greatest opportunity for uptake and adherence to a patient's action plan to meet their goals.

Note: A care plan is a guide/roadmap created by the health care team and agreed upon by the patient that outlines relevant assessment results and the identification of problems/concerns. The plan indicates the prioritization of each problem/concern, what will happen to address each, when it will happen, who will do it and the outcomes expected. The plan is expected to be updated and modified as needed.

An action plan is an ongoing Self-Management tool that a patient creates and uses to help achieve his or her personal goals. Action plans outline concrete and specific behaviours/activities a patient agrees to do that is directly related to a larger goal.



Section 3:

Cardiovascular Rehabilitation Core Components

Standard 3.1: Every cardiovascular rehabilitation program shall ensure that the following core components are included in every patient's individualized and coordinated care plan. The provision of these components shall follow best practice guidelines and standards and be delivered by qualified, skilled and competent staff:

1. Health behaviour change and education;
2. Cardiovascular risk factor management; and
3. Cardioprotective therapies.

Note: CR programs should strive to include all core components in their program and staffing models. It is recognized that this may not be feasible in all contexts. In such instances, CR programs should strive to establish and maintain systematic linkages with outside services to ensure coordination and communication.

3.1 Health Behaviour Change and Education

Adopting healthy behaviours is the cornerstone of prevention of cardiovascular disease. The goal of CR is for healthy behaviours to become part of everyday practices. Most cardiovascular risk factors can be improved by adopting these healthy behaviours. Change in behaviour requires more than education; it requires a targeted approach to understanding both heart-healthy and unhealthy behaviours and skills to modify actions to shift from one to the other. This approach ultimately helps patients to manage the physical, social, and emotional elements of cardiovascular disease (Ghisi, 2014).

Standard 3.1.1: Education and counselling shall be offered on an individual and/or group basis integrating behavior change theoretical models and motivational interviewing and incorporating self-management education.

Standard 3.1.2: Health behaviour change interventions shall be used in conjunction with education and coaching strategies. Guidance shall be provided to help patients gain not only knowledge, but also the confidence, skills and motivation to successfully create and sustain changes in their lives.

Standard 3.1.3: Patient education shall be delivered using interactive, individualized and experiential methods where clinicians are facilitators of education. Whenever possible, spouses, significant others and/or other family members should be offered access to information sessions.

Note: While patient education may not independently reduce all-cause mortality or cardiovascular morbidity, educational interventions can significantly improve health-related quality of life. The objective of patient education is to increase knowledge, understanding, and help develop the skills that are necessary for heart-healthy behaviour change and, in turn, to reduce cardiovascular risk (Brown, 2013).

Strategies to support the implementation of Standards 3.1.1 to 3.1.3 are provided in Appendix B. These health behavior change and education standards should be a part of all subsequent core components.

3.2 Cardiovascular Risk Factor Management

Every CR program shall work collaboratively with care providers to reduce overall mortality, morbidity and hospital readmissions by managing risk factors. The following section highlights standards for cardiovascular risk factor management.

Physical Activity and Exercise

The benefits of exercise for developing and maintaining cardiorespiratory and muscular fitness have been well documented and far outweigh the risks in most adults (Garber, 2011).

Standard 3.2.1: Physical activity and exercise patterns shall be assessed at intake. This assessment shall include:

- Current physical activity, exercise, and periods of inactivity;
- Symptoms with physical activity and exercise;
- Physical abilities and limitations; and
- Motivation and any barriers that limit daily physical activity and exercise.

Standard 3.2.2: Patients shall be encouraged to engage in regular physical activity and exercise to meet national and international guidelines (e.g., CSEP, CACPR/CACR, AHA, ACSM).

Standard 3.2.3: For the purpose of outcome measurement, patients shall be formally assessed for exercise capacity at program intake and discharge.

Note: Although the actual method to assess exercise capacity may be different between patients, the modality for assessing individual exercise capacity at each time point should be the same *within* each patient.

Standard 3.2.4: Patients who plan to engage in a moderate to vigorous exercise program or who are at a high risk for an adverse cardiac event (e.g., arrhythmia or ischemia) during exercise shall undergo either a graded exercise test (GXT) or a cardiopulmonary test (CPX) for assessment of



exercise capacity to guide an individualized exercise prescription. Evaluation of other patient groups should be based on clinical judgement and include another appropriate and validated assessment (i.e. 6 minute walk test (Bellet, 2012)).

Note: Among writing group members and stakeholders, there were a variety of opinions expressed regarding the optimal role of stress testing in cardiovascular rehabilitation and the need for further evidence to guide recommendations, especially in lower risk patient subgroups.

Standard 3.2.5: Patients enrolled in the exercise program shall be provided with an individualized exercise prescription using up-to-date best practice guidelines (ACSM, CSEP, CACPR, AACVPR). This prescription shall be delivered by health care professionals who have reviewed and assimilated the physical activity and exercise capacity assessment findings including the patient's medical history as well as behaviour management strategies and the patient's individual goals.

Note: For summary of the roles, responsibilities and qualifications for CR program staff who can develop an exercise prescription, staff please refer to the CACR guidelines, 2009, Chapter 12.

Note: For tips on designing individualized exercise prescriptions, please see Appendix C.

Standard 3.2.6: Clinical parameters shall be monitored during the exercise program to ensure safe and ideal exercise prescription and progression as it pertains to the individuals' cardiovascular risk and goals.

Nutrition

A focus should be on making healthy dietary changes for the purpose of achieving overall health and well-being. In addition, misconceptions about dieting, health, and weight cycling should be addressed and corrected to prevent maladaptive eating behaviours (Tylka, 2014).

Standard 3.2.7: Patients shall be offered information and/or education regarding healthy food choices and eating habits to promote cardiovascular health.

Standard 3.2.8: Patients who are not meeting recommended targets for lipids, glucose and/or blood pressure control shall be offered a referral to a registered dietitian for assessment and counselling within the cardiovascular rehabilitation program or in the community.

Standard 3.2.9: Nutrition therapy shall be based on the most recent Canadian Cardiovascular Society Guidelines for the Diagnosis and Treatment of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult, Canadian Diabetes Association Clinical Practice Guidelines, Canadian Hypertension Education Program and Canada's Food Guide Recommendations.

Note: Among writing group members and stakeholders, there were a variety of opinions expressed regarding the optimal role of weight management interventions in cardiovascular rehabilitation and the need for further evidence to guide recommendations.

Please see Appendix D for information about validated tools for nutritional assessment.

Tobacco use

The following standards are consistent with the 5A framework (Ask, Advise, Assess, Assist, and Arrange). Best practice guidelines for the assessment of tobacco use, smoking cessation, behavioural-psychological and pharmacological interventions as outlined by CAN-ADAPTT clinical practice guidelines shall be used.

Standard 3.2.10: Patients shall be assessed for their history of tobacco use and exposure. This assessment shall include: current smoking status, history of tobacco use, past quit attempts, motivation and confidence to quit, and exposure to second-hand smoke.

Standard 3.2.11: Current tobacco users shall be encouraged and supported using behavioural and/or pharmacological approaches (as recommended by best practice guidelines) to stop using all forms of tobacco permanently.

Standard 3.2.12: Patients who are currently using tobacco or are at risk of using tobacco shall be offered a referral to a specialized effective smoking/tobacco cessation program in cardiovascular rehabilitation if available or in the community.

Psychological and psychosocial health

People taking part in CR may have many different emotional issues, and a comprehensive, holistic assessment and treatment plan is crucial to achieving the desired outcomes. Ideally, every patient should be screened for psychological and psychosocial risk factors and complications of cardiovascular illnesses including depression, anxiety, psychological stress, illness perception, social isolation and support, anger, hostility, substance abuse, occupational distress, and sexual dysfunction/adjustment.

Standard 3.2.13: Patients shall be screened and/or assessed for depressive symptoms or depression at the intake assessment and at discharge from the cardiovascular rehabilitation program using a tool validated for case finding in cardiovascular populations. See Appendix E for a list of tools.

Standard 3.2.14: Patients who require further intervention for depression, psychosocial stress, or any other emotional issues shall be offered a referral to a qualified psychologist, psychiatrist, social worker and/or other vocational resources (i.e., return to work) within the cardiovascular rehabilitation program or in the community.

Standard 3.2.15: Psychosocial interventions shall be empirically-validated and/or theoretically-based and provided by someone qualified to deliver these interventions.

Standard 3.2.16: Patients who show evidence of or acknowledge alcohol dependence or abuse shall be offered a referral to an appropriate resource. Written communication to the patient's primary care provider by a CR team member is required.

Hypertension, dyslipidemia, dysglycemia

Standard 3.2.17: Best practice guidelines and standards (including CHEP, CCS/CACR, NCEP, CDA, C-Change) shall be followed for target levels for hypertension, dyslipidemia and dysglycemia.

3.3 Cardioprotective Therapies

Certain pharmacological therapies are available to reduce morbidity and mortality in patients with ischemic heart disease and multiple risk factors. Every CR program shall work in collaboration with care partners to optimize cardioprotective therapies that are recommended by clinical guidelines.

Standard 3.3.1: Medication history reconciliation shall be performed and documented at the intake assessment and at discharge in accordance with the host institution's policies and procedures.

Standard 3.3.2: Patient adherence to, tolerance of, and contraindication for cardioprotective therapies shall be assessed and documented at the intake assessment and at discharge. Patient education and counselling shall be provided to optimize patient medication adherence.

Standard 3.3.3: Written documentation of reasons for eligible patients not taking appropriate recommended cardioprotective medications as per CCS current clinical guidelines (e.g., ASA, antiplatelet agent other than ASA, beta blocker, statin, ACE inhibitor/ARB) shall be included in the patient record.

Standard 3.3.4: The program physician, designated health care professional, or primary care provider shall be consulted when pharmacological adjustment is recommended by an appropriate health care provider to help patients achieve the recommended targets for blood pressure, lipids or glucose for their cardiovascular risk profile or cardioprotective medications above.

Section 4:

Program Administration, Human Resources and Program Evaluation

In Ontario, CR programs may operate in a stand-alone community setting or as part of a larger hospital system. To date, the CR literature does not identify an optimal organizational structure or design. However, each CR program needs to make decisions about the most appropriate organizational structure, the job titles and the relationships between these positions to achieve the goals of the program.

Standard 4.1: A cardiovascular rehabilitation program shall have an organizational framework that illustrates and defines the interrelationships between the CR participants (e.g., patients and caregivers), the CR program, and the health care system.

Standard 4.2: A cardiovascular rehabilitation program shall have an operational framework that provides a description of the CR program's organizational structure, the job titles and the relationships between these positions.

Standard 4.3: A cardiovascular rehabilitation program shall have a process in place for the development, implementation and review of policies and procedures.

4.1 Health and Safety

Standard 4.1.1: Health and safety considerations shall be built into strategic and tactical decision-making around the operations of a cardiovascular rehabilitation program. (e.g., work design and layout, purchasing of equipment, operational procedures).

Note: In the Occupational Health and Safety Act of Ontario, the employer shall take all precautions reasonable in the circumstances to protect the health and safety of a worker. The employer shall also follow the accompanying health care regulations. Ideally, workplaces should always be improving service delivery in a way that improves the health and safety and minimizes risk to health care providers, support staff, and participants (patient and caregivers) within the CR program.

Standard 4.1.2: Supervision during exercise sessions shall be established. Staff-to-patient ratios should directly reflect the specific type of patient population, the risk stratification level of patients, the population mix of programs, the physical layout of the exercise area, and the availability of prompt assistance.

Standard 4.1.3: Patient clinical parameters shall be assessed pre-, during-, and post-exercise sessions by qualified staff and documented in the patient's health record. The design and execution of exercise routines shall be monitored and adjusted based on these assessments according to clinical guidelines.



Standard 4.1.4: There shall be a process for ongoing communication of any changes in the patient's clinical risk profile identified by a cardiovascular rehabilitation team member. This communication shall include interaction with the patient's cardiovascular rehabilitation program team members, cardiovascular specialist, and primary care provider.

Standard 4.1.5: A cardiovascular rehabilitation program shall have a documented emergency response strategy that is incorporated into the program's manual of policies and procedures. This strategy shall be based upon an assessment of the potential emergency scenarios. Possible scenarios may include abnormal patient clinical parameters, patient medical emergency, family member medical emergency, patient with 'do not resuscitate' (DNR) status. Emergency plans shall include the specific responsibilities of each staff member and responders. A review of emergency plans shall be included as part of the orientation program for new employees.

Standard 4.1.6: Regular training achieved through mock drills for a medical emergency shall be part of the emergency training to maintain staff's preparedness. These drills should be conducted at least twice a year and in accordance with other regulatory requirements.

Standard 4.1.7: A cardiovascular rehabilitation program that is not located in a hospital setting shall have a pre-arranged link to local emergency response services and on-site automated external defibrillator (AED) devices.

Standard 4.1.8: All professional staff who provide clinical care shall complete and maintain certification in the appropriate basic cardiac life-support (BCLS) program. Ideally, all staff in a cardiovascular rehabilitation program should complete and maintain BCLS training.

Standard 4.1.9: Cardiovascular rehabilitation facilities shall be designed or selected based on patient safety, confidentiality, accessibility, and the types of services provided.

Note: Please see Appendix F for a list of key points for CR program facilities, equipment, and environmental considerations from the CACR guidelines, 2009, Chapter 12.

Standard 4.1.10: In programs with patients who have special needs that have been identified (e.g., sensory impairment, neuromusculoskeletal disorders), appropriate equipment and resources to ensure patient and staff safety shall be made available.

4.2 Human Resources

CR programs will vary in their resources and scope. The number and type of regulated health care professionals required within any program will depend on the complexity of the patient population served, the services offered, the size of the program, the human resources policies within the organization, and local resources to provide the program.

Although there will be some variety in the CR program staff depending on the size and scope of the services provided, every program requires a manager or clinical coordinator to provide administrative leadership and vision to the program. A physician is also necessary to provide clinical leadership and medical direction for the CR program and ensure that the policies and procedures are consistent with evidence-based standards and guidelines for the delivery of CR. These roles may be fully or partially combined, depending on the size and scope of the CR program. For a full summary of the roles, responsibilities and qualifications for CR program staff please refer to CACR guidelines, 2009, Chapter 12.

Standard 4.2.1: Cardiovascular rehabilitation services shall be provided through an integrated interprofessional team consisting of qualified practitioners, led by a program manager.

Standard 4.2.2: A cardiovascular rehabilitation program's team shall include a physician who has demonstrated sustained interest, commitment, and knowledge in cardiovascular rehabilitation.

The delivery of the core components of CR requires expertise from a range of different professionals working within their scope of practice while adhering to their individual college regulations. Although the composition of each team may differ, collectively, the team shall have the necessary knowledge, skills and competencies to meet the standards, and be committed to ongoing professional development.

While more than one member of a team can provide a number of CR services within a program, some services require specific skills and training and should be performed by the appropriate health care professional. The services can be provided or shared by team members (i.e. patient education) and the services that can be performed only by specifically trained individuals (i.e. psychological counselling) should be determined.

Standard 4.2.3: A cardiovascular rehabilitation program shall define the specific qualifications and responsibilities for each health care professional within the cardiovascular rehabilitation team. These qualifications should include the required level of education, training, experience, and certification/recertification.

Standard 4.2.4: A cardiovascular rehabilitation program shall have regularly planned meetings with cardiovascular rehabilitation team members to facilitate communication between team members, provide regular opportunities to discuss the progress and/or challenges of the patients enrolled in the program, and create a forum to improve care and services.

Standard 4.2.5: A cardiovascular rehabilitation program shall have a formalized process to ensure team members have access to educational/training opportunities to maintain competency. This process should include access to opportunities for continual professional growth and development.

4.3 Program Design Considerations

Impediments to referral include substantial challenges such as cost and accessibility faced by the traditional on-site hospital-based locations of CR. Home-based, community-based, internet-based, and telemedicine have shown promise as alternative locations and techniques for delivering CR (Clark, 2013).

Standard 4.3.1: A cardiovascular rehabilitation program shall strive to integrate evidence-based alternative models (e.g., location and monitoring techniques) of cardiovascular rehabilitation, tailored to individuals' needs, risk factor profiles and preferences in order to enhance access, adherence, and effectiveness.

4.4 Audit and Evaluation

Standard 4.4.1: At a minimum, a cardiovascular rehabilitation program shall address the core CCS quality indicators that include:

1. The median number of days between receiving the referral at the cardiovascular rehabilitation program to patient enrollment;
2. The number of patients referred to the cardiovascular rehabilitation program;
3. The percentage of patients in the cardiovascular rehabilitation program who received patient self-management education either individually or within a group prior to program discharge;
4. The percentage of patients enrolled in the program who achieved at least a half metabolic equivalent (MET) increase in their exercise capacity from the initial to the final exercise session; and
5. Documentation of an emergency response strategy and appropriately qualified staff.

A CR program should strive to measure as many of the remaining CCS quality indicators as possible (Grace, 2014). Please see Appendix G for a full list of the CCS quality indicators.

Section 5:

Program Completion and Long-Term Management

5.1 Program Completion

Ideally at program completion, patients will have attained their CR goals, be meeting exercise and nutrition guidelines, and be within the recommended targets for blood pressure and lipids.

Standard 5.1.1: Patients shall be provided written documentation of their risk factor profile at program completion. The summary should include a pre/post comparison of patients' risk factor profiles. This summary should also include guidelines for exercise prescription and recommended management to achieve and/or maintain an optimal risk profile.

Standard 5.1.2: Discharge or summary letters shall be sent to the primary care provider and cardiovascular specialist within one month of graduation from the cardiovascular rehabilitation program. The discharge summary shall include a pre/post comparison of patients' risk factor profile. This summary should also include: current medications, individualized guidelines for ongoing exercise, and long-term management goals.

5.2 Long-term Management

Standard 5.2.1: Preparatory activities shall begin prior to discharge from the cardiovascular rehabilitation so that patients receive appropriate counselling by program staff to help them plan and implement maintenance strategies while they are still connected with the program.

Standard 5.2.2: Patients shall be provided with self-management strategies to help them transition from the cardiovascular rehabilitation program and continue to work towards minimizing their risk for cardiovascular disease progression following graduation from the program.

Standard 5.2.3: Cardiovascular rehabilitation program staff shall be aware of and encourage transition to available community services that can continue to support the patient through specific long-term self-management strategies.

Note: Sustaining positive behaviour and lifestyle changes requires an ongoing supportive environment for long-term adherence. Ongoing support that extends well beyond cardiovascular rehabilitation program graduation is necessary to help ensure that new behaviours are integrated with everyday life (Murray, 2013). Promoting ongoing self-management strategies should include, but are not limited to: educational materials, recommended on-line applications or tools, self-monitoring resources, patient support groups and access to community services.



Appendix A: Abbreviations and Definitions

Abbreviations

6MWT	6 minute walk test
AACVPR	American Association of Cardiovascular and Pulmonary Rehabilitation
ACE	Angiotensin-converting-enzyme
ACSM	American College of Sports Medicine
AED	Automated external defibrillator
AHA	American Heart Association
ARB	Angiotensin receptor blocker
ASA	Acetyl-salicylic acid (aspirin)
BACPR	British Association for Cardiovascular Prevention and Rehabilitation
BCLS	Basic cardiac life support
BMI	Body mass index
CACPR	Canadian Association of Cardiovascular Prevention and Rehabilitation (formerly known as Canadian Association of Cardiac Rehabilitation)
CACR	Canadian Association for Cardiac Rehabilitation
C-Change	Canadian Cardiovascular Harmonization of National Guidelines Endeavour
CCS	Canadian Cardiovascular Society
CDA	Canadian Diabetes Association
CHEP	Canadian Hypertension Education Program
CR	Cardiovascular rehabilitation
CSEP	Canadian Society for Exercise Physiology
CV	Cardiovascular
DASH	Dietary Approaches to Stop Hypertension
DASI	Duke Activity Status Index
ECG	Electrocardiogram
GXT	Graded exercise test
HADS	Hospital Anxiety and Depression Scale
HbA1c	Glycated hemoglobin
LVEF	Left ventricular ejection fraction
MI	Myocardial infarction
NCEP	National Cholesterol Education Program
NYHA	New York Heart Association
RARE	Risk of Activity Related Events
QI	Quality Indicator

Definitions

Action plan	An ongoing Self-Management tool that a patient creates and uses to help achieve their personal goals. Action plans outlines concrete and specific behaviours/activities a patient agrees to do that is directly related to a larger goal.
Care plan	A guide/roadmap created by the health care team and agreed upon by the patient that outlines relevant assessment results and the identification of problems/concerns. The plan indicates the prioritization of each problem/concern, what will happen to address each, when it will happen, who will do it and the outcomes expected. The plan is expected to be updated and modified as needed.
Discharge	CR program discharge is defined as the patient participated in at least some of the program and the CR chart was closed out by the CR team. (CCS- QI, September 2013)
Exercise	A form of physical activity that is planned, structured, and designed to improve at least one aspect of physical fitness, such as strength, flexibility or aerobic capacity endurance.
Formal assessment	An in-person assessment that is document in the patient's health record.
Intake appointment	An appointment that provides general patient education about the cardiovascular rehabilitation program and a preliminary assessment of individual cardiovascular risk factors, and begins the collection of necessary baseline information for enrollment in the services offered. These activities could take place over one or more appointments.
Intake assessment	The first in-person appointment at which the patient undergoes the first comprehensive clinical assessment. The intake assessment may or may not be conducted at the intake appointment.
Interprofessional	Comprising members or services from more than one regulated health profession working interdependently to achieve specified, shared objectives.
Patient	The individual who has been referred to cardiovascular rehabilitation, whether or not they are referred from an inpatient facility or outpatient setting.
Patient centered	The care plan is developed based on the patient's goals.
Physical activity	Any bodily movements produced by skeletal muscles that result in energy expenditure and part of everyday life.
Policy	A statement about how an organization deals with issues or specific situations or processes related to operations, human resources, program administration, clinical programs, occupational health and safety.
Primary care providers	Family physicians, nurse practitioners.



Procedure	The specific, detailed operational steps that form the part of a process, whether clinical or administrative, and include the necessary personnel, equipment and timelines required to complete the task or process.
Program enrollment	The time at which a patient registers for one or more specific services in the cardiovascular rehabilitation program.
Program completion	Completion of a formal re-assessment at the end of the CR intervention (CCS-QI, 2013). At completion, reassessment will determine the patient's progress toward goals and guide long-term secondary prevention plans.
Quality-based procedures (OBPs)	Clusters of patients with clinically related diagnosis or treatments that have been identified by an evidence-based framework as providing opportunity for process improvements, clinical re-design, improved patient outcomes, enhanced patient experience and potential cost savings. (www.health.gov.on.ca)
Referral for cardiovascular rehabilitation	When the following criteria are satisfied: There is an official written or electronic communication on behalf of the referring health care provider for the referral to cardiovascular rehabilitation, and the referral information has been received by the cardiovascular rehabilitation program.
Risk factor profile	The list of an individual's cardiovascular risk factors.
Self-management	The decisions and strategies undertaken by an individual in order to manage the symptoms, treatment, physical and psychosocial consequences and lifestyle changes inherent in living with a chronic condition. (Barlow, 2002)

Appendix B: Strategies for Health Behaviour Change and Education

To achieve health behaviour change for their patients, cardiovascular rehabilitation services should ensure that:

- Health behaviour change interventions are underpinned by an evidence-based and relevant theoretical framework (Painter, 2008).
- All clinical staff have opportunity for training in communication and coaching skills and motivational interviewing techniques (Health Canada Council, 2012).
- Program staff effectively assess a patient's readiness to change and use motivational interviewing techniques with patients to appropriately address the patient's beliefs about a health behaviour change and/or confidence to make a health behaviour change (Chase, 2013; Elis, 2011, Ferrier, 2011; Miller, 2010).
- Patients are offered a menu of options for programming that best fit their needs to achieve their health behaviour changes (Clark, 2013; Shanmugasegaram, 2013; Wingham, 2006).
- Misconceptions patients may have regarding their illness or regarding cardiovascular rehabilitation are addressed as these may lead to increased disability (Fernandez, 2009; French, 2006).
- Program staff support patients to set goals, create action plans, problem solve and plan for relapses to improve long-term self-management in areas where patients feel most confident to make changes (Ferrier, 2011; Health Canada Council, 2012; Lorig, 2003).
- The program provides regular follow-up to assess, progress and revise goals and action plans throughout cardiovascular rehabilitation (Lorig, 2003).
- These health behaviour change standards/components be a part of all subsequent core components as outlined in Section 3.

To achieve effective education for their patients, CR services should ensure that:

- Education is designed to increase knowledge, understanding and skills to promote health behaviour change (Ghisi, 2014).
- Education is delivered using a health behaviour change theory (Adams, 2010).
- Individual and group learning needs and learning styles are assessed, and information delivered is tailored to these needs and styles (de Melo Ghisi, 2014; Inott, 2011; Scott, 2003).



- An appropriate curriculum design is used to plan education that includes learning outcomes and learning activities.
- Group education can provide added support for patients and families. Patients, families and support persons are encouraged to be active participants in the education process where sharing and encouraging peer support occurs to maximize group dynamics.
- Adult learning principles are incorporated (Russel, 2006).
- Training is provided to staff in adult learning principles and group facilitation.
- Health literacy universal precaution methods are used when educating patients in both written and spoken communication to ensure patient comprehension and safety (Coleman, 2011; Dewalt, 2011; Speros, 2011).
- Education is delivered through various teaching methods using effective instructional materials that use plain language with clear design and the materials are culturally sensitive (Garity, 2000; Seligman, 2007).
- Education for CR is tailored to patients so that it will empower them to better manage their condition. Topics may include (CACR, AACVPR, BACPR):
 - Anatomy and pathophysiology of cardiovascular disease;
 - Management of cardiovascular disease including percutaneous interventions, pharmacotherapy and surgical interventions;
 - Exercise prescription and progression;
 - Exercise safety;
 - Physical activity;
 - Nutrition and healthy eating;
 - Tobacco use cessation;
 - Risk factors and risk factor management including blood pressure, lipids and glucose;
 - Psychosocial risks;
 - Occupational and vocational factors;
 - Sexual intimacy;
 - Advanced care planning;
 - Self-management (e.g., empowerment, goal setting, action planning, problem solving and relapse planning); and
 - Additional information that arises from learning needs assessments.

Appendix C:

Tips for Designing Individualized Exercise Programs

To achieve effective management of physical activity and exercise for their patients, CR services should ensure that:

- Exercise prescriptions are provided in a way that the patient can implement and monitor them independently;
- Exercise prescriptions are progressed and/or modified as needed, to achieve exercise within the aerobic range for each patient to optimize fitness improvements;
- All exercise prescriptions include exercising 5-7 days/week, striving to achieve the minimum 30 minutes per day of aerobic exercise;
- Patients are educated about the difference between aerobic exercise and active living and encouraged to incorporate both into their regular routines;
- Exercise outside of the formal cardiovascular rehabilitation setting is emphasized, encouraged, and facilitated from the onset of the program;
- Resistance training is included in exercise guidelines given to all patients, tailored as needed to individual's abilities and progressed/modified as needed;
- Patients use an exercise self-monitoring tool to track their exercise and provide feedback to the cardiovascular rehabilitation team; and
- Patients develop action plans for exercise to ensure they are able to maintain this healthy behaviour long-term.

Appendix D: Nutrition Assessment Tools

There are several dietary assessment methods available for different applications. These include, but not limited to 24-hour recall, food frequency questionnaires (FFQ), food diaries, and electronic records. It is important to note that, due to the various limitations of the dietary assessments available to date, the most suitable method depends upon whether the specific purpose of the assessment is achieved (Cade, 2004).

In a CR setting, the purpose of the nutrition assessment is to identify an individual's overall dietary quality. The focus of the assessment may include an evaluation of total energy intake, percentage of energy intake from macronutrients, types of fats, amount of fibre, and salt intake. However, individuals may have multiple co-morbidities such as diabetes and/or chronic kidney disease. This may result in further examination of other factors such as distribution of carbohydrates, intake of micronutrients, etc.

It is well recognized that there is no gold standard for directly assessing the validity of a FFQ (Cade, 2004). However, consideration has been given to the methods available and the overall design of validation studies. Please see below for a list of some of the validated FFQ's.

1. The Diet Habit Survey (20 pgs) (Connor, 1992).
2. Fat Intake Questionnaire (FIQ) - only measures fat, saturated fat and cholesterol (Retzlaff, 1997).
3. Rate Your Plate (RYP) - 2 versions: RYPall looks at total diet and RYPheart was developed specific for heart disease prevention (Brown University, 2010; Gans, 2000).
4. SmartDiet™ (16 pgs) (Wiens, 2007; Wiens, 2010).
5. The 14-item FFQ for cardiovascular prevention (Laviolle, 2005).
6. The 14-point Mediterranean Diet Adherence Screener (MEDAS) (Schröder, 2011).

Appendix E: Screening Tools for Symptoms of Depression

Instrument	Description	Reference
Beck Depression Inventory- Version II (BDI-II)*	12 items	Wang, 2013
Center of Epidemiological Studies Depression Scale (CES-D)*+	20 items	Radloff, 1977
Hospital Anxiety and Depression Scale (HADS)*	7 items for anxiety 7 Items for depression	Zigmond, 1983
Patient Health Questionnaire*+ 9 item version (PHQ-9) 2 item version (PHQ-2)	PHQ- 2: 2 items (first two items from PHQ-9) PHQ-9: 9 items	Lowe, 2005 Kroenke, 2001
STOP-D+	5 items	Young, 2007
Zung Depression Scale*	20 items	Zung, 1965

*included in the Canadian Cardiovascular Society- Quality Indicators for Cardiac Rehabilitation/Secondary Prevention (Grace, 2014)

+ available within the public domain



Appendix F: Facility and Equipment Considerations

The following is a list of key points for CR program facilities, equipment, and environmental considerations from the CACR guidelines 2009, Chapter 12.

Facilities, Equipment, and Environmental Considerations

Key Points

- The program's service delivery model, patient volumes, human resources, safety and financial resources will all influence decisions concerning safety, facilities and equipment.
- Facilities should provide adequate space for patient reception and waiting, patient consultation and examination, exercise and exercise testing, education, counselling, confidential chart storage, safekeeping for valuables and easily available restroom (ACSM, 2012).
- Facilities and availability of multimodality exercise equipment should be adequate to meet the goals of the program.
- Facilities should be wheelchair and stretcher accessible with non-slip floors and clear hallways.
- Isolated areas and locker rooms should have a warning or alarm system in case of emergency.
- In addition to program specific needs, administrative considerations must also be in compliance with the Occupational Health and Safety Code from their provincial jurisdiction as well as any other legislative, regulatory, or other organizational policies such as privacy legislation.
- When planning for facility space, it is recommended that potential program growth be taken into consideration to ensure adequate physical space for future needs.

Safety Considerations

- Given the population the program serves as well as the potential of medical emergencies, it is recommended that the facility be both wheelchair and stretcher accessible.
- Hallways should be clear at all times with room to maneuver an emergency stretcher in and out of the facility, including adequate space in elevators.
- Safety manuals and guidelines should be developed and made available to all staff.
- Floors should not be slippery. Non-slip finishes will reduce the incidence of falls. Cushioned flooring is beneficial in exercise areas. Consideration for cleaning of blood and body fluids needs to be considered in choosing finishes.
- Locker rooms and swimming areas require a dry area suitable for defibrillation. Hand rails in showers and non-slip floors help to prevent falls.
- It is recommended that water temperature in showers be moderate to prevent post-exercise hypotension.
- Isolated areas should be minimal and regularly monitored. Exercise, locker room, and washrooms should have emergency call buttons.

Exercise Sessions Area

Key Points

- There should be designated areas for exercise sessions.
- Equipment layout should allow for personnel movement between pieces of equipment.
- Walking or running tracks or lanes should be obstacle free and have clear traffic patterns.
- Environmental considerations in terms of air flow, temperature and humidity should be closely observed.
- Equipment should be available to assist with reasonably anticipated adverse patient situations. For example, people with low or elevated blood pressure (BP equipment) COPD (O2 sat. monitor) dysrhythmias (ECG tracing) diabetes (glucose meter). Staff should have the training and the scope of practice to properly use the equipment. Supplies/equipment to provide initial treatment of adverse events should be immediately available (ie. Hypoglycaemia management).
- Areas used for impact activities should be constructed of shock-absorbing materials to prevent injuries.
- A regularly tested telephone or other emergency call system should be available.
- Unimpeded access to hand and equipment cleaning supplies.

Equipment Selection

Key Points

- The selection and purchase or lease of cardiovascular or resistance training equipment requires informed decision-making.
- Factors to consider are cost, aesthetics, references, warrant, support and training and maintenance requirements.
- Whenever possible, equipment should be purchased from reputable companies with demonstrable records of responsible, ethical behavior with regard to making user-friendly equipment and honoring their service commitments.
- For more detailed discussion on these points, the reader is referred to as the CACR Guidelines, 2nd edition or ACSM’s Resource Manual for Guidelines for Exercise Testing and Prescription, 5th edition.

Equipment Maintenance and Calibration

Key Points

- All equipment should be maintained and calibrated based on the manufacturer’s instructions.
- Annually, all equipment should be checked for grounding and current leakage.
- All equipment should be Canadian Standards Association (CSA), or equivalent, approved.
- Equipment cleaning and maintenance schedules should be established and adhered to with corresponding checklists and documentation.
- Equipment breakdown, incident, and repair logs for tracking purposes should also be established and maintained.

Additional information can also be found in the ACSM’s Health/Fitness Facility Standards and Guidelines 4th Edition, 2012.

Appendix G:

Canadian Cardiovascular Society- Quality Indicators for Cardiac Rehabilitation/Secondary Prevention

As part of the recommendations for implementation of the Canadian Heart Health Strategy and Action Plan (www.chhs-scsc.ca) the CCS is helping to build knowledge infrastructure, through its Data Definitions and Quality Indicator (QI) project. The CCS selected cardiac rehabilitation and secondary prevention as a content area for QI development. An initial list of 37 QIs, in the areas of structure, process, and outcome were developed. After a rigorous consensus process, the following list represents the revised list of QIs. The ‘top’ 5 QIs are indicated with an * below. For further information about the development of the QIs for cardiac rehabilitation, please see Grace, 2014.

Quality Indicator	Description
CR-1*	Percentage of eligible in-patients referred to a Cardiac Rehabilitation (CR) Program.
CR-2a	Percentage of eligible in-patients who were referred to CR and who enroll in CR within 30 days after hospital discharge.
CR-2b*	Number of days between receipt of referral at the CR program to patient enrollment for eligible in-patients.
CR-3	Percentage of CR-eligible patients enrolled in a program post hospital discharge.
CR-4	Percentage of CR patients who received a comprehensive assessment of the risk for adverse cardiovascular events.
CR-5*	Percentage of patients in the CR program who received individual or group patient self-management education.
CR-7	Percentage of patients who were taking ASA at the time of CR program discharge.
CR-8	Percent of patients on anti-platelet agents other than ASA at the time of CR program discharge.
CR-9	Percentage of patients on a Beta-blocker at CR discharge.
CR-10	Percentage of patients on statins at program discharge.
CR-12	Percentage of patients at CR discharge on Angiotensin-Converting Enzyme (ACE) inhibitors/Angiotensin Receptor Blockers (ARBs).
CR-13	Percentage of patients in CR program who received individualized assessment of blood pressure control.
CR-14	Percentage of patients in CR who received individualized assessment of lipid control.

Quality Indicator	Description
CR-15	Percentage of patients in CR program who received individualized assessment of adiposity.
Cr-16	Percentage of patients in CR program who received individualized assessment of blood glucose control.
CR-17*	Percentage of CR patients who achieved a half metabolic equivalent (MET) increase in their exercise capacity from pre- to post-program.
CR-18	Percentage of prescribed CR exercise sessions completed by patient.
CR-20	Percentage of CR patients meeting the target amount of 150 minutes of physical activity per week at program completion.
CR-21	Percentage of CR patients who were provided an intervention to promote long-term physical activity post-CR.
CR-22	Percentage of CR patients with assessment for depression or depressive symptoms.
CR-23	Percentage of CR patients with suspected clinical depression who were referred for mental health management.
CR-26	Percentage of CR patients who are current or recent smokers and who were referred for smoking cessation.
CR-27	Percentage of CR patients who were current or recent smokers at enrollment in the program who were not smoking at program completion.
CR-30	Percentage of CR patients who were referred to a stress management intervention.
CR-31	Percentage of CR programs that have a physician medical director providing program oversight.
CR-32*	The percentage of CR programs with a documented emergency response strategy and appropriately qualified staff.
CR-33	Percentage of CR patients with documented communication between the CR program and primary health care practitioner (PHCP).
CR-35	Percentage of CR discharge summaries that include the recommended elements.
CR-36	Percentage of patients with a documented summative communication from the CR program.
CR-37	Percentage of patients enrolled in CR who complete the program.

Appendix H:

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Additional Resources

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Appendix I:

List of Standards

Standard 1.1.1: Indications for cardiovascular rehabilitation for persons with established cardiovascular disease shall include:

- Any one of the following diagnoses:
 - Acute coronary syndrome (e.g., ST elevation MI, non-ST elevation MI, or unstable angina)
 - Chronic stable angina
 - Chronic stable heart failure
- Post-procedure such as:
 - Percutaneous coronary or valvular intervention
 - Coronary artery bypass surgery
 - Cardiac valve surgery
 - Cardiac transplantation
 - Ventricular assist device implantation.

Eligible patients for referral to cardiovascular rehabilitation shall include patients with an appropriate diagnosis listed in Standard 1.1.1.

Standard 1.1.2: Referrals for cardiovascular rehabilitation shall be made by a primary care provider or specialist whose role includes caring for the patient.

Standard 1.1.3: A referral for cardiovascular rehabilitation shall be made as an official communication between the referring health care provider, the cardiovascular rehabilitation program and the patient.

Standard 1.1.4: Patients referred for cardiovascular rehabilitation shall be contacted by a staff member of the cardiovascular rehabilitation program within 2 weeks of referral to arrange an intake appointment.

Standard 2.1.1: All interested patients referred to outpatient cardiovascular rehabilitation shall undergo an intake assessment in a timely fashion so that their rehabilitation program can be initiated, either through an education class or intake session, ideally within one month of referral (Dafoe, 2006). The intake assessment often occurs during the initial appointment, but may also require a follow-up appointment for completion.

Standard 2.1.2: The intake assessment shall include but is not limited to assessment and documentation of the following:

- Demographic information and social determinants of health (e.g., years of education completed, employment/working conditions, social support) including potential barriers to participation and adherence such as financial constraints;
- Medical history, symptoms, and advanced care preferences for future health treatment;
- Cardiovascular risk factors (e.g., hypertension, dyslipidemia, dysglycemia, diet, tobacco use, physical activity and exercise patterns, obesity) including laboratory results (e.g., lipid profile, glucose, HbA1c);
- Clinical enquiry about emotional and psychosocial health status, psychological stress, current and recent alcohol consumption, sleep quality, and specific signs/symptoms of sleep apnea;
- Best possible medication history and reconciliation with emphasis on the use and tolerance of evidence-based cardioprotective therapies and adherence;
- Physical exam focusing on vital signs, anthropometric measurements, cardiovascular, respiratory and neuromusculoskeletal systems as well as procedure-related sites (e.g., puncture site, leg, forearm and/or sternum when applicable); and
- A review of the ECG and where available, cardiac imaging (LVEF) and testing of exercise capacity and ischemic thresholds.

Standard 2.1.3: Patients shall be given written information regarding their personal cardiovascular risk factor profile.

Standard 2.1.4: The intake assessment shall include a patient-centered and comprehensive care plan that prioritizes goals and outlines action strategies for risk reduction. The written care plan shall be available to the patient within one month following the initial assessment.



Standard 2.1.5: An intake letter summarizing the information collected during the intake assessment outlined in Standard 2.1.2, the care plan and goals shall be sent to the patient's identified primary care provider and cardiovascular specialist within one month following completion of the initial assessment.

Standard 2.2.1: A standardized assessment of the patient's risk for an acute cardiovascular complication during exercise shall be completed prior to the initiation of exercise therapy. Risk stratification for exercise shall use relevant patient information (e.g., left ventricular ejection fraction (LVEF), history of arrhythmia, device therapy settings, symptoms, functional capacity) and a validated risk stratification tool. Possible tools include the: Duke Treadmill Score, Cardiometabolic Score, Canadian Cardiovascular Society Angina Classification (CCS), New York Heart Association classification (NYHA) (CACR guidelines, 2009, Chapter 10), and RARE score (Lacombe, 2014).

Note: Risk stratification is a standard assessment of the patient's risk for a cardiovascular complication or clinical event (i.e. fall) during exercise. The purpose of risk stratification is to help guide the exercise prescription and the supervision required.

Standard 2.3.1: Care planning for cardiovascular rehabilitation shall be based on self-management principles and adult learning principles that incorporate behavioural change concepts.

Standard 2.3.2: The care plan shall be individualized to the patient's needs and goals within each of the core components and align with the patient's preference and choice. A menu-based approach, delivered in accessible venues and times (e.g., mornings and evenings), provides the greatest opportunity for uptake and adherence to a patient's action plan to meet their goals.

Standard 3.1: Every cardiovascular rehabilitation program shall ensure that the following core components are included in every patient's individualized and coordinated care plan. The provision of these components shall follow best practice guidelines and standards and be delivered by qualified, skilled and competent staff:

1. Health behaviour change and education;
2. Cardiovascular risk factor management; and
3. Cardioprotective therapies.

Standard 3.1.1: Education and counselling shall be offered on an individual and/or group basis integrating behavior change theoretical models and motivational interviewing and incorporating self-management education.

Standard 3.1.2: Health behaviour change interventions shall be used in conjunction with education and coaching strategies. Guidance shall be provided to help patients gain not only knowledge, but also the confidence, skills and motivation to successfully create and sustain changes in their lives.

Standard 3.1.3: Patient education shall be delivered using interactive, individualized and experiential methods where clinicians are facilitators of education. Whenever possible, spouses, significant others and/or other family members should be offered access to information sessions.

Standard 3.2.1: Physical activity and exercise patterns shall be assessed at intake. This assessment shall include:

- Current physical activity, exercise, and periods of inactivity;
- Symptoms with physical activity and exercise;
- Physical abilities and limitations; and
- Motivation and any barriers that limit daily physical activity and exercise.

Standard 3.2.2: Patients shall be encouraged to engage in regular physical activity and exercise to meet national and international guidelines (e.g., CSEP, CACR, CACPR, AHA, ACSM).

Standard 3.2.3: For the purpose of outcome measurement, patients shall be formally assessed for exercise capacity at program intake and discharge.

Standard 3.2.4: Patients who plan to engage in a moderate to vigorous exercise program or who are at a high risk for an adverse cardiac event (e.g., arrhythmia or ischemia) during exercise shall undergo either a graded exercise test (GXT) or a cardiopulmonary test (CPX) for assessment of exercise capacity to guide an individualized exercise prescription. Evaluation of other patient groups should be based on clinical judgement and include another appropriate and validated assessment (i.e. 6 minute walk test (Bellet, 2012)).

Standard 3.2.5: Patients enrolled in the exercise program shall be provided with an individualized exercise prescription using up-to-date best practice guidelines (ACSM, CSEP, CACPR, AACVPR). This prescription shall be delivered by health care professionals who have reviewed and assimilated the physical activity and exercise capacity assessment findings including the patient's medical history as well as behaviour management strategies and the patient's individual goals.

Standard 3.2.6: Clinical parameters shall be monitored during the exercise program to ensure safe and ideal exercise prescription and progression as it pertains to the individuals' cardiovascular risk and goals.



Standard 3.2.7: Patients shall be offered information and/or education regarding healthy food choices and eating habits to promote cardiovascular health.

Standard 3.2.8: Patients who are not meeting recommended targets for lipids, glucose and/or blood pressure control shall be offered a referral to a registered dietitian for assessment and counselling within the cardiovascular rehabilitation program or in the community.

Standard 3.2.9: Nutrition therapy shall be based on the most recent Canadian Cardiovascular Society Guidelines for the Diagnosis and Treatment of Dyslipidemia for the Prevention of Cardiovascular Disease in the Adult, Canadian Diabetes Association Clinical Practice Guidelines, Canadian Hypertension Education Program and Canada's Food Guide.

Standard 3.2.10: Patients shall be assessed for their history of tobacco use and exposure. This assessment shall include: current smoking status, history of tobacco use, past quit attempts, motivation and confidence to quit, and exposure to second-hand smoke.

Standard 3.2.11: Current tobacco users shall be encouraged and supported using behavioural and/or pharmacological approaches (as recommended by best practice guidelines) to stop using all forms of tobacco permanently.

Standard 3.2.12: Patients who are currently using tobacco or are at risk of using tobacco shall be offered a referral to a specialized effective smoking/tobacco cessation program in cardiovascular rehabilitation if available or in the community.

Standard 3.2.13: Patients shall be screened and/or assessed for depressive symptoms or depression at the intake assessment and at discharge from the cardiovascular rehabilitation program using a tool validated for case finding in cardiovascular populations. See Appendix E for a list of tools.

Standard 3.2.14: Patients who require further intervention for depression, psychosocial stress, or any other emotional issues shall be offered a referral to a qualified psychologist, psychiatrist, social worker and/or other vocational resources (i.e., return to work) within the cardiovascular rehabilitation program or in the community.

Standard 3.2.15: Psychosocial interventions shall be empirically-validated and/or theoretically-based and provided by someone qualified to deliver these interventions.

Standard 3.2.16: Patients who show evidence of or acknowledge alcohol dependence or abuse shall be offered a referral to an appropriate resource. Written communication to the patient's primary care provider by a CR team member is required.

Standard 3.2.17: Best practice guidelines and standards (including CHEP, CCS/CACR, NCEP, CDA, C-Change) shall be followed for target levels for hypertension, dyslipidemia and dysglycemia.

Standard 3.3.1: Medication history reconciliation shall be performed and documented at the intake assessment and at discharge in accordance with the host institution's policies and procedures.

Standard 3.3.2: Patient adherence to, tolerance of, and contraindication for cardioprotective therapies shall be assessed and documented at the intake assessment and at discharge. Patient education and counselling shall be provided to optimize patient medication adherence.

Standard 3.3.3: Written documentation of reasons for eligible patients not taking appropriate recommended cardioprotective medications as per CCS current clinical guidelines (e.g., ASA, antiplatelet agent other than ASA, beta blocker, statin, ACE inhibitor/ARB) shall be included in the patient record.

Standard 3.3.4: The program physician, designated health care professional, or primary care provider shall be consulted when pharmacological adjustment is recommended by an appropriate health care provider to help patients achieve the recommended targets for blood pressure, lipids or glucose for their cardiovascular risk profile or cardioprotective medications above.

Standard 4.1: A cardiovascular rehabilitation program shall have an organizational framework that illustrates and defines the interrelationships between the CR participants (e.g., patients and caregivers), the CR program, and the health care system.

Standard 4.2: A cardiovascular rehabilitation program shall have an operational framework that provides a description of the CR program's organizational structure, the job titles and the relationships between these positions.

Standard 4.3: A cardiovascular rehabilitation program shall have a process in place for the development, implementation and review of policies and procedures.

Standard 4.1.1: Health and safety considerations shall be built into strategic and tactical decision-making around the operations of a cardiovascular rehabilitation program. (e.g., work design and layout, purchasing of equipment, operational procedures).

Standard 4.1.2: Supervision during exercise sessions shall be established. Staff-to-patient ratios should directly reflect the specific type of patient population, the risk stratification level of patients, the population mix of programs, the physical layout of the exercise area, and the availability of prompt assistance.

Standard 4.1.3: Patient clinical parameters shall be assessed pre-, during-, and post-exercise sessions by qualified staff and documented in the patient's health record. The design and execution of exercise routines shall be monitored and adjusted based on these assessments according to clinical guidelines.



Standard 4.1.4: There shall be a process for ongoing communication of any changes in the patient's clinical risk profile identified by a cardiovascular rehabilitation team member. This communication shall include interaction with the patient's cardiovascular rehabilitation program team members, cardiovascular specialist, and primary care provider.

Standard 4.1.5: A cardiovascular rehabilitation program shall have a documented emergency response strategy that is incorporated into the program's manual of policies and procedures. This strategy shall be based upon an assessment of the potential emergency scenarios. Possible scenarios may include abnormal patient clinical parameters, patient medical emergency, family member medical emergency, patient with 'do not resuscitate' (DNR) status. Emergency plans shall include the specific responsibilities of each staff member and responders. A review of emergency plans shall be included as part of the orientation program for new employees.

Standard 4.1.6: Regular training achieved through mock drills for a medical emergency shall be part of the emergency training to maintain staff's preparedness. These drills should be conducted at least twice a year and in accordance with other regulatory requirements.

Standard 4.1.7: A cardiovascular rehabilitation program that is not located in a hospital setting shall have a pre-arranged link to local emergency response services and on-site automated external defibrillator (AED) devices.

Standard 4.1.8: All professional staff who provide clinical care shall complete and maintain certification in the appropriate basic cardiac life-support (BCLS) program. Ideally, all staff in a cardiovascular rehabilitation program should complete and maintain BCLS training.

Standard 4.1.9: Cardiovascular rehabilitation facilities shall be designed or selected based on patient safety, confidentiality, accessibility, and the types of services provided.

Standard 4.1.10: In programs with patients who have special needs that have been identified (e.g., sensory impairment, neuromusculoskeletal disorders), appropriate equipment and resources to ensure patient and staff safety shall be made available.

Standard 4.2.1: Cardiovascular rehabilitation services shall be provided through an integrated interprofessional team consisting of qualified practitioners, led by a program manager.

Standard 4.2.2: A cardiovascular rehabilitation program's team shall include a physician who has demonstrated sustained interest, commitment, and knowledge in cardiovascular rehabilitation.

Standard 4.2.3: A cardiovascular rehabilitation program shall define the specific qualifications and responsibilities for each health care professional within the cardiovascular rehabilitation team. These qualifications should include the required level of education, training, experience, and certification/recertification.

Standard 4.2.4: A cardiovascular rehabilitation program shall have regularly planned meetings with cardiovascular rehabilitation team members to facilitate communication between team.

Standard 4.2.5: A cardiovascular rehabilitation program shall have a formalized process to ensure team members have access to educational/training opportunities to maintain competency. This process should include access to opportunities for continual professional growth and development.

Standard 4.3.1: A cardiovascular rehabilitation program shall strive to integrate evidence-based alternative models (e.g., location and monitoring techniques) of cardiovascular rehabilitation, tailored to individuals' needs, risk factor profiles and preferences in order to enhance access, adherence, and effectiveness.

Standard 4.4.1: At a minimum, a cardiovascular rehabilitation program shall address the core CCS quality indicators that include:

1. The median number of days between receiving the referral at the cardiovascular rehabilitation program to patient enrollment;
2. The number of patients referred to the cardiovascular rehabilitation program;
3. The percentage of patients in the cardiovascular rehabilitation program who received patient self-management education either individually or within a group prior to program discharge;
4. The percentage of patients enrolled in the program who achieved at least a half metabolic equivalent (MET) increase in their exercise capacity from the initial to the final exercise session; and
5. Documentation of an emergency response strategy and appropriately qualified staff.

Standard 5.1.1: Patients shall be provided written documentation of their risk factor profile at program completion. The summary should include a pre/post comparison of patients' risk factor profiles. This summary should also include guidelines for exercise prescription and recommended management to achieve and/or maintain an optimal risk profile.

Standard 5.1.2: Discharge or summary letters shall be sent to the primary care provider and cardiovascular specialist within one month of graduation from the cardiovascular rehabilitation program. The discharge summary shall include a pre/post comparison of patients' risk factor profile. This summary should also include: current medications, individualized guidelines for ongoing exercise, and long-term management goals.

Standard 5.2.1: Preparatory activities shall begin prior to discharge from the cardiovascular rehabilitation so that patients receive appropriate counselling by program staff to help them plan and implement maintenance strategies while they are still connected with the program.

Standard 5.2.2: Patients shall be provided with self-management strategies to help them transition from the cardiovascular rehabilitation program and continue to work towards minimizing their risk for cardiovascular disease progression following graduation from the program.

Standard 5.2.3: Cardiovascular rehabilitation program staff shall be aware of and encourage transition to available community services that can continue to support the patient through specific self-management strategies.

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