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THE CANADIAN CARDIOVASCULAR SOCIETY QUALITY INDICATORS E- CATALOGUE

QUALITY INDICATORS FOR CARDIAC REHABILITATION AND SECONDARY PREVENTION

A CCS CONSENSUS DOCUMENT

FINAL v1.0

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BACKGROUND

The quality indicators outlined in this document have been selected through a national consensus process as the key quality indicators specific to **Cardiac Rehabilitation and Secondary Prevention**.

Contact the Canadian Association of Cardiac Rehabilitation CACR for the latest CACR registry data dictionary.

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PREAMBLE

Cardiac Rehabilitation (CR) programs may vary from centre to centre; however, all programs are presumed to offer the core components as per the 3rd Edition of the CACR Guidelines (Chapter 11). In addition, CR Programs should consider including the core components that have been recently proposed by the British Association For Cardiovascular Prevention and Rehabilitation (2012), which include: health behaviour change and education, lifestyle risk factor management, psychosocial health, medical risk factor management, and cardio-protective therapies.

Through this quality indicator (QI) development process, the working group aimed to assess the most important care metrics (termed quality indicators) across all core program components. However, in some instances there was insufficient evidence of impact on mortality, or insufficient reliability or validity in assessment, to deem a care metric as a QI. As such, no quality indicators were developed for assessment of: physical activity, overall medication adherence, quality of life, and return to work. However, these are presumed as important components in the delivery of care in CR programs.

While we have focused herein on coronary artery disease (CAD) patients, we would like to recognize recommendations to refer valve patients, arrhythmia, and peripheral vascular disease patients.

For the quality indicators defined in this document, please note the following terminology and definitions:

TERM	DEFINITIONS
Reference Period	Is defined at the time of analysis. The recommended minimum period of assessment is annually.
Enrollment	CR Program enrollment is defined as patient attendance at a first CR program visit.
Completion	To complete the CR program a patient must have attended at least some of the CR intervention components and have had a formal re-assessment by the CR team at the conclusion of the CR intervention.
Discharge	CR Program discharge is defined as patient participated in at least some of the program and the CR chart was closed out by the CR team.
CR Intervention Components	The CR intervention components are defined as per the BACPR Core Components, namely: health behaviour change and education, lifestyle risk factor management, psychosocial health, medical risk factor management, and cardio-protective therapies.

IN-PATIENTS REFERRED TO A CARDIAC REHABILITATION PROGRAM

Description	The percentage of eligible in-patients referred to a Cardiac Rehabilitation (CR) Program.
Numerator	<p>A subset of the denominator representing a number of in-patients who were referred to a CR Program prior to hospital discharge.</p> <p>A referral is deemed being made if both of the following criteria are satisfied:</p> <ol style="list-style-type: none"> 1. There is an official written or electronic communication on behalf of the health care provider for referral to CR and 2. The referral information has been received by the CR program.
Denominator	<p>The number of eligible in-patients in the reference period with any of the conditions or interventions listed below:</p> <ul style="list-style-type: none"> • Acute coronary syndrome; <ul style="list-style-type: none"> ○ Acute Myocardial Infarction (STEMI, non-STEMI); ○ Unstable angina; • Chronic stable angina; • Stable heart failure; • Percutaneous coronary intervention; • Coronary artery bypass surgery; • Cardiac valve surgery. <p>Exclusions:</p> <ul style="list-style-type: none"> • CR eligible in-patient with a documented medical reason for non-referral, such as comorbid life-threatening condition, serious mental illness, or inability to ambulate. • CR eligible in-patient with a documented patient-centered reason for non-referral. • CR eligible in-patient discharged to long-term care facility or inpatient rehabilitation. • CR eligible in-patient who died prior to discharge.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	Electronic medical records, retrospective chart review, prospective flow sheets, Provincial and territorial hospital discharge abstract databases, CIHI hospital database, and/or cardiac registries.
Rationale	
CR participation significantly reduces mortality and morbidity. Inpatient referral prior to discharge facilitates timely, universal access to CR.	
Clinical Recommendation(s)	
<ul style="list-style-type: none"> • All eligible CR patients should be referred to a CR program prior to hospital discharge. (Strong Recommendation, High Quality Evidence) <p>The joint CACR-CCS Policy Statement recommends a benchmark of 85% referral.</p> <p>Modified from References:</p> <ul style="list-style-type: none"> • Stone, J. A., Arthur, H. M., & Suskin, N. (2005). Canadian guidelines for cardiac rehabilitation and cardiovascular disease prevention. <i>Translating knowledge into action</i>. • Thomas, R. J., King, M., Lui, K., Oldridge, N., Piña, I. L., & Spertus, J. (2010). AACVPR/ACCF/AHA 2010 Update: Performance Measures on Cardiac Rehabilitation for Referral to Cardiac Rehabilitation/Secondary Prevention Services: Endorsed by the American College of Chest Physicians, the American College of Sports Medicine, the American Physical Therapy Association, the Canadian Association of Cardiac Rehabilitation, the Clinical Exercise Physiology Association, the European Association for Cardiovascular Prevention and Rehabilitation, the Inter-American Heart Foundation, the National ... Journal of the American College of Cardiology, 56(14), 1159-1167. • Grace, S. L., Chessex, C., Arthur, H., Chan, S., Cyr, C., Dafoe, W., ... & Suskin, N. (2011). Systematizing Inpatient Referral to Cardiac Rehabilitation 2010: Canadian Association of Cardiac Rehabilitation and Canadian Cardiovascular Society Joint Position Paper: Endorsed by the Cardiac Care Network of Ontario. <i>Canadian Journal of Cardiology</i>, 27(2), 192-199. 	
Method of Reporting	
The reported statistic will be a percentage.	
Challenges to Implementation/Interpretation	
<ul style="list-style-type: none"> • It can be difficult to ascertain numerator cases if the referring hospital does not have a system for recording patient referrals or tracking referral receipt by CR programs. 	

CARDIAC REHABILITATION WAIT TIME FROM REFERRAL TO ENROLLMENT

Description	The median number of days between receipt of referral at the Cardiac Rehabilitation (CR) program to patient enrollment.
Numerator	The number of calendar days from receipt of referral at the CR program to patient enrollment.
Denominator	All patients enrolled in the CR program in the reference period.
	<p>Exclusions:</p> <ul style="list-style-type: none"> • Patient experienced a new clinical event, which is documented. • Patient delayed initial appointment date due to non-clinical factors, which are documented (e.g. personal travel).
Method of Calculation	Median number of days, calculated for the population of reference as described in the denominator section.
Sources of Data	Program databases and/or Canadian Cardiac Rehabilitation Registry.

Rationale

At present, there is limited evidence testing whether timely referral and entry into CR reduces morbidity and mortality compared with delayed referral and/or entry into CR. There is some evidence that facilitated referral to CR and rapid program enrollment may increase rates of program attendance and program completion (Parker et al., 2009; Russell et al., 2011), even among smokers, and is safe in low-risk patients (Robinson et al., 2011). Moreover, there is some evidence that early initiation of exercise has beneficial effects on exercise self-efficacy (Dolansky et al., 2011), maximum oxygen uptake (Valkeinen et al., 2010) and the left ventricle (Haykowsky et al., 2011).

References:

- Parker, K., Stone, J. A., Arena, R., Lundberg, D., Aggarwal, S., Goodhart, D., & Traboulsi, M. (2011). An Early Cardiac Access Clinic Significantly Improves Cardiac Rehabilitation Participation and Completion Rates in Low-Risk ST-Elevation Myocardial Infarction Patients. *Canadian Journal of Cardiology*, 27(5), 619-627.
- Russell, K. L., Holloway, T. M., Brum, M., Caruso, V., Chessex, C., & Grace, S. L. (2011). Cardiac rehabilitation wait times: effect on enrollment. *Journal of Cardiopulmonary Rehabilitation and Prevention*, 31(6), 373
- Robinson, H. J., Samani, N. J., & Singh, S. J. (2011). Can low risk cardiac patients be 'fast tracked' to Phase IV community exercise schemes for cardiac rehabilitation? A randomised controlled trial. *International journal of cardiology*, 146(2), 159-163.
- Dolansky, M. A., Zullo, M., Boxer, R., & Moore, S. M. (2011). Initial Efficacy of a Cardiac Rehabilitation Transition Program: Cardiac TRUST. *Journal of Gerontological Nursing*, 37(12), 36.
- Valkeinen, H., Aaltonen, S., & Kujala, U. M. (2010). Effects of exercise training on oxygen uptake in coronary heart disease: a systematic review and meta-analysis. *Scandinavian journal of medicine & science in sports*, 20(4), 545-555.
- Haykowsky, M., Scott, J., Esch, B., Schopflocher, D., Myers, J., Paterson, I., ... & Clark, A. M. (2011). A Meta-analysis of the effects of Exercise Training on Left Ventricular Remodeling Following Myocardial Infarction: Start early and go longer for greatest exercise benefits on remodeling. *Trials*, 12(1), 92.

Clinical Recommendation(s)

All patients referred to CR should undergo entry assessment in a timely fashion so their CR program can be initiated.

Modified from Reference:

- Dafoe, W., Arthur, H., Stokes, H., Morrin, L., & Beaton, L. (2006). Canadian Cardiovascular Society Access to Care Working Group on Cardiac Rehabilitation. Universal access: but when? Treating the right patient at the right time: access to cardiac rehabilitation. *Can J Cardiol*, 22(11), 905-911 (Strong Recommendation, Low Quality Evidence)

Method of Reporting

The reported statistic will be a median.

Challenges to Implementation/Interpretation

- Information required to identify exclusions may be variably ascertained and documented.

PATIENT SELF-MANAGEMENT EDUCATION

Description	The percentage of patients in the Cardiac Rehabilitation (CR) Program who received patient self-management education either individually or within a group prior to program discharge.
Numerator	<p>A subset of the denominator representing a number of patients for whom there is documentation of receiving patient self-management education as defined by the CACR Guidelines (see below) before program discharge.</p> <p>This education is defined as not only information provision concerning the core areas of CR, but also theoretically-informed behaviour change techniques (see Clinical Recommendations for the definition of the self-management education).</p>
Denominator	The number of patients discharged from the CR program in the reference period.
Method of Calculation	$\text{Numerator} / \text{Denominator} * 100$
Sources of Data	Program databases and/or Canadian Cardiac Rehabilitation Registry.

Rationale

While patient education may not reduce all-cause mortality or cardiac morbidity, educational interventions can significantly improve health-related quality of life. We would argue that a key objective of patient education is to increase knowledge and understanding, which is necessary for heart-healthy behaviour change, which in turn reduces cardiac risk.

Reference:

- Brown, J. P., Clark, A. M., Dalal, H., Welch, K., & Taylor, R. S. (2012). Effect of patient education in the management of coronary heart disease: a systematic review and meta-analysis of randomised controlled trials. *European Journal of Preventive Cardiology*

Clinical Recommendation(s)

European Guidelines on Cardiovascular Disease Prevention in Clinical Practice (v2012):

- Multimodal interventions integrating education on healthy lifestyle medical resources are recommended.

Based on the CACR 3rd Edition Guidelines patient self-management education:

- Includes an informational component which:
 - Discusses specific health goals;
 - Is personalized;
 - Explains the risks of not changing, the benefits of changing, and seeks to influence outcome beliefs regarding the outcome efficacy of interventions or behavioural changes;
 - Often emphasizes proximal risks and benefits over distal ones;
 - Seeks to heighten self-efficacy concerning possible effective self-regulation of specific behaviours; and,
 - May seek to elicit positive emotions, to increase optimism about the possibility of change, and to heighten the salience of personal experience or other evidence supporting self-efficacy
- Is led by professional staff, and not by lay persons, with regular contact between staff and patients.
- Can be delivered as stand-alone sessions (which is preferred) or incorporated into other activities. Where the delivery is incorporated into other activities the goals of the education must be clearly defined and delivered.
- Education can be delivered in individual or group settings.

Method of Reporting

The reported statistic will be a percentage.

Challenges to Implementation/Interpretation

- Detailed information on the content of the self-management education is required for this indicator to be comparable across CR programs.

INCREASE IN EXERCISE CAPACITY

Description The percentage of Cardiac Rehabilitation (CR) patients who achieved a half metabolic equivalent (MET) increase in their exercise capacity from the initial to the final exercise session.

Numerator A subset of the denominator representing a number of patients who achieved a half metabolic equivalent (MET) increase in their exercise capacity from the initial to the final exercise session.

Denominator The total number of patients who completed the CR Program in the reference period.

To complete the CR program a patient must have attended at least some of the CR intervention components and have had a formal re-assessment by the CR team at the conclusion of the CR intervention. See definition of CR intervention components in preamble.

Exclusions

- Patients who cannot walk on a treadmill unaided, or who cannot cycle on a bike ergometer.
- Patients who do not meet the ACSM safety recommendations for undertaking a stress test.

Method of Calculation Numerator / Denominator * 100

Sources of Data Program databases and/or Canadian Cardiac Rehabilitation Registry.

Rationale

Systematic programs of CR that included prescribed exercise training can significantly improve patients' functional capacity. Enhanced cardiovascular fitness (evaluated by treadmill stress testing and expressed in METs) is associated with better survival and fewer CV events. The positive effect of exercise training and improved cardiometabolic fitness, as a means of improving patient outcomes, is firmly grounded in the positive effects these interventions have on exercise vascular biology. A half MET improvement is related to health benefit.

References:

- Kavanagh, T., Mertens, D. J., Hamm, L. F., Beyene, J., Kennedy, J., Corey, P., & Shephard, R. J. (2002). Prediction of long-term prognosis in 12 169 men referred for cardiac rehabilitation. *Circulation*, 106(6), 666-671.
- Myers, J., Prakash, M., Froelicher, V., Do, D., Partington, S., & Atwood, J. E. (2002). Exercise capacity and mortality among men referred for exercise testing. *New England Journal of Medicine*, 346(11), 793-801.
- Piepoli MF, Corra U, Benzer W, Bjarnason-Wehrens B, Dendale P, Gaita D, McGee H, Mendes M, Niebauer J, Zwisler AO, and Schmid J. 2010. Secondary prevention through cardiac rehabilitation: physical activity counselling and exercise training. *Eur Heart J* 31(16): 1967-1974. doi: 10.1093/eurheartj/ehq236

Clinical Recommendation(s)

Assessment of exercise capacity should be made at program entry and exit in order to evaluate change in exercise capacity.

Reference:

- Sanderson, B. K., Southard, D., & Oldridge, N. (2004). AACVPR consensus statement. Outcomes evaluation in cardiac rehabilitation/secondary prevention programs: improving patient care and program effectiveness. *Journal of cardiopulmonary rehabilitation*, 24(2), 68.

Method of Reporting

The reported statistic will be a percentage.

Challenges to Implementation/Interpretation

- Modality used to measure exercise capacity may vary by program which may inhibit cross-comparison (i.e. 6-minute walk test, graded exercise test, cardiopulmonary test; measured capacity vs. estimated).
- While exercise stress tests are recommended, not all programs have MDs to supervise them.
- Variation in exercise stress testing protocols from pre to post-program inhibits comparison over time.
- Symptom limits to tests inhibits ability to ascertain maximum capacity.

EMERGENCY RESPONSE STRATEGY

Description	The percentage of Cardiac Rehabilitation (CR) programs with a documented emergency response strategy and appropriately-qualified staff.
Numerator	A subset of the denominator representing a number of CR programs that meet both of the following criteria: <ol style="list-style-type: none"> 1. An emergency response strategy enabling prompt defibrillation is in place to deal with medical emergencies. 2. All clinical staff have current basic life-support (BLS) certification including use of Automated External Defibrillation (AED) devices.
Denominator	The total number of CR programs within Canada/province/regional health care authority in the reference period.
Method of Calculation	Numerator / Denominator * 100
Sources of Data	Audit of written program policies, interviews with program staff, or provincial/regional/national CR program survey.

Rationale

Emergency response strategies are important since exercise training and or stress testing is associated with a small incremental risk over and above the co-incidental risk for a cardiovascular emergency experienced by any cardiac patient. Prompt defibrillation has been demonstrated to be the most effective form of management for cardiac arrest. Prompt defibrillation is often facilitated by other basic and advanced life saving support strategies to promote good outcomes in patients who have experienced cardiac arrest.

Reference:

- Thomas, R. J., King, M., Lui, K., Oldridge, N., Piña, I. L., Spertus, J., ... & Whitman, G. R. (2007). AACVPR/ACC/AHA 2007 Performance Measures on Cardiac Rehabilitation for Referral to and Delivery of Cardiac Rehabilitation/Secondary Prevention Services: Endorsed by the American College of Chest Physicians, American College of Sports Medicine, American Physical Therapy Association, Canadian Association of Cardiac Rehabilitation, European Association for Cardiovascular Prevention and Rehabilitation, Inter-American Heart Foundation, National Association of Clinical Nurse Specialists, Preventive *Journal of the American college of Cardiology*, 50(14), 1400-1433.

Clinical Recommendation(s)

CACR Guidelines, 3rd Edition (Chapter 12: Program Administration and Human Resources, p.430)

- All CR programs require a process in place that addresses site-specific facility equipment in conjunction with safety requirements and considerations
- All CR programs require policies and procedures for the management of medical emergency situations.

Method of Reporting

The reported statistic will be a percentage.

Challenges to Implementation/Interpretation

- There may be variation in the response strategy, making comparison across CR programs difficult. For example, a policy and procedure for cardiac arrest; pre-arranged link to local ambulance service; and / or on-site automated external defibrillator (AED) devices. Moreover, for programs located in a hospital setting, there may be existing hospital-wide cardiac emergency response with more advanced resuscitation care protocols and equipment.

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