



Background

The Provincial Psychology Professional Practice Council identified an opportunity to leverage local efforts to advance clarity of the psychologists' role and evidence-based practice in health care. Each of these resources is developed independently by AHS Psychologists and reviewed by the AHS Provincial Psychology Professional Practice Council. We are pleased to share this information to support both psychologists' practice and leaders' awareness of the quality and cost-effective impacts psychologists can bring to programs, to further AHS' priorities and quality, patient and family centred care.

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The Role of Psychologists on Cardiovascular Health Care Teams

Psychologists provide:

- Screening and formal assessment of diverse psychosocial issues common in patients with cardiovascular disease (CVD) including mood and anxiety disorders, traumatic stress, anger, substance use, disordered eating, and sleep disturbance
- Evidence-based individual and group-based psychological interventions to reduce heightened levels of stress, depression, anxiety, and hostility/anger
- Effective self-management interventions for coping with somatic concerns, illness anxiety, fatigue, and pain
- Behaviour change interventions to support the initiation and maintenance of exercise, medication adherence, smoking cessation, and dietary modification to reduce CVD risk
- Gold standard interventions for sleep disturbances, including sleep restriction, stimulus control, and cognitive restructuring for the treatment of insomnia
- Consultation to multidisciplinary staff in the management of patients with a wide range of emotional responses to CVD, psychological disorders, and non-adherence to medical regimes

- Couple- and family-based interventions to assist patients' loved ones in coping with CVD, and to support family-based efforts at initiating and maintaining heart-healthy living
- Program development and evaluation services in addition to research support and initiatives
- Ethical consultation concerning patient and family management
- Training multidisciplinary health care providers to deliver behavioural strategies for promoting treatment adherence and for responding to challenging or distressed patients
- Mentorship and supervision to clinical and research trainees from a variety of health-related fields

Cardiovascular Disease

- CVD is a broad term to describe diseases of the vascular system and heart. It includes coronary artery disease (CAD), heart failure, heart valve disease, congenital heart disease, arrhythmias, peripheral artery disease, and stroke.
- CVD commonly results from arteries that are narrowed (i.e., atherosclerosis) and/or hardened (i.e., arteriosclerosis). Atherosclerosis and arteriosclerosis can lead to angina (chest pain) and myocardial infarction (MI; also known as a heart attack).
- CVDs are the leading cause of mortality worldwide¹ and are responsible for 25% of all Canadian deaths and 22 billion dollars in annual health care costs^{2,3}.
- Increased risk of CVD is associated with several non-modifiable patient characteristics including older age, hereditary factors, and ethnic background (e.g., South Asian, Indigenous peoples); however CVD affects many people with diverse backgrounds^{1,6,7}.
- The majority of CVD risk is associated with a small set of behavioural factors, including smoking, excess weight, sedentary behaviour, lack of exercise, dietary factors, and stress/psychosocial factors⁸.

Typical Psychological Issues Faced by Patients with CVD

- Significant advances in medical management for CVDs have led to large reductions in mortality⁹. As a consequence, an increasing number of individuals are living with complex psychosocial and

behavioural health needs related to chronic disease management.

- Psychological distress is common in patients with CVD. Emotional reactions after a cardiac event include concerns about the course of illness, adjustment to physical limitations, changing interpersonal relationships, return-to-work, difficulty making lifestyle changes, and financial stressors¹⁰.
- Key psychosocial issues covered in the Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) guidelines¹¹, and deemed relevant to CVD patients, include psychological distress, depression, anxiety, sleep disturbance, social isolation, sexual concerns, addictions, personality factors, and difficulty adhering to recommended health behaviour changes.
- The prevalence of psychological distress in people with CVD is difficult to exactly estimate due to differences in definition/measurement, time-frame, and demographic factors.
- The majority of research has been on depression (i.e., major depressive disorder) in individuals with CAD. The point prevalence of depression in patients with CVD is in the range of 20-30%¹².
- In heterogeneous CVD samples, it is estimated that 37-41% of patients have elevated symptoms of anxiety¹¹.

The Role of Psychological Factors in the Onset/Maintenance of CVD

- The CACPR guidelines report “strong, prospective evidence that psychosocial factors are associated with an increased risk of developing symptomatic coronary artery disease and convey a worse prognosis in cardiovascular populations.” (P. 107)¹¹
- One of the most widely cited studies relevant to psychosocial factors and CVD is INTERHEART⁸, a prospective case-control investigation of initial MI with almost 30,000 participants across 52 countries.
- This study reports that over 90% of the risk for initial MI is accounted for by nine modifiable risk factors including abnormal lipids; smoking; hypertension; diabetes; abdominal obesity; psychosocial factors; consumption of fruits, vegetables, and alcohol; and regular physical activity. All of these are strongly linked to psychosocial/behavioural factors, suggesting the important role of

psychology to intervene for primary, secondary, and tertiary prevention of CVD.

- In INTERHEART, “psychosocial factors” represented an aggregate measure consisting of depressive symptoms, perceived stress, life events, and low locus of control. The presence of these psychosocial factors increased the chances of having a heart attack by 2.51 (99% CI 2.15–2.93) comparable to odds ratios associated with hypertension and tobacco use (2.48 (2.30–2.68) and 2.95 (2.72–3.20), respectively).
- Psychosocial factors associated with CVD incidence and adverse outcomes include depressed mood, anxiety, low socioeconomic status, social isolation, chronic family stress, hostility/anger, chronic work stress, acute stressors and sleep disturbance¹³. Some of these psychosocial factors are described in further detail below. It is worth noting that psychological risk factors tend to cluster together within individuals.
- In addition to psychological distress, it is important to consider behavioural factors implicated in the pathophysiology of CVD, including smoking, excessive alcohol use, inactivity, dietary factors, and medication non-adherence.

Psychological Distress

- Self-reported psychological distress (variably defined) is associated with increased risk of CVD events including MI, angina, mortality, and stroke¹¹. Chronic psychological distress is associated with increased risk for CAD and worse prognosis¹¹.
- Acute psychological stressors can also trigger cardiac events, and are often identifiable by patients in the period preceding their MI¹¹.
- Other forms of psychological distress associated with CVD risk include work stress, low socioeconomic status, and social isolation¹¹.
- A meta-analysis of 11 prospective studies of patients with existing CVD reports that an aggregate index of optimism, positive affect, purpose, and wellbeing is associated with a 13% reduction in re-hospitalizations/mortality¹⁵.

Depression

- Consistent evidence in systematic reviews and meta-analyses shows that depression, as well as elevated depressive symptoms, are associated with an increased risk of developing CVD and

worse prognosis, including increased risk of death in patients with existing CVD^{11,13,14}.

- Mechanisms linking depression to CVD are not entirely clear. A complex bi-directional relationship likely exists, such that depression worsens CVD and CVD worsens depression¹².
- Both behavioural factors (e.g., depressed individuals may be less likely to adhere to health recommendations, more socially isolated, less likely to participate in cardiac rehabilitation) and biological factors (e.g., depressed individuals are susceptible to autonomic nervous system activation, inflammation, mental stress-induced ischemia) are likely to play a role^{11,12,13}.

Anxiety

- Compared to depression, anxiety is not as well-studied and findings are mixed. Anxiety is generally not as robust a predictor of CVD endpoints as depression, and the associations between anxiety and CAD have generally been smaller^{11,13}.
- Elevated anxiety predicts mortality 10 years after coronary angioplasty (HR, 1.50; 95% CI 1.14–1.98)¹⁶. However, some studies with CVD samples show no significant association between anxiety and mortality¹⁷, or show that anxiety reduces the likelihood of premature mortality¹⁸.
- Mixed findings could relate to the observation that anxiety is adaptive under some circumstances (e.g., by motivating treatment adherence) and that significant comorbidity exists between anxiety and depression.

Sleep

- An emerging area of research relates to sleep as a potential CVD risk factor. Sleep disturbances associated with cardiovascular risk factors and disease include: shiftwork, short and long sleep, obstructive sleep apnea, and insomnia^{13,19}.
- Short sleep (typically defined as less than 5-6 hours/night) is associated with mortality (RR, 1.12; 95% CI, 1.08-1.16), diabetes mellitus (1.37, 1.22-1.53), hypertension (1.17, 1.09-1.26), CVD (1.16, 1.10-1.23), CAD (1.26, 1.15-1.38), and obesity (1.38, 1.25-1.53), according to a meta-analysis of prospective cohort studies²⁰.
- Insomnia symptoms (difficulty falling asleep, staying asleep, non-restorative sleep) are prospectively associated with increased risk of developing or dying from various types of CVD including acute MI, CAD, or stroke^{21,22}.

Psychological Assessment

- Psychological assessment recommendations regarding CVD generally relate to patients in cardiac rehabilitation and/or screening for psychological distress by multidisciplinary health care providers^{11,23}.
- Major cardiology organizations including CACPR recognize the value of routine assessment of psychosocial risk factors with an emphasis on depression screening in cardiac care settings including hospitals, physicians' offices, and cardiac rehabilitation centres^{11,24,48,49}.
- Advantages and limitations of screening instruments need to be considered. They serve to alert but not to diagnose. Appropriate follow-up care must be delivered to people with elevated scores^{11,23,35}.
- Brief screening and assessment instruments for depressed mood and anxiety commonly used with CVD patients include: the Beck Depression Inventory, Hospital Anxiety and Depression Scale, Spielberger State Anxiety Inventory, Profile of Mood States, Symptom Checklist 90, Brief Symptom Inventory, Patient Health Questionnaire, Center for Epidemiologic Studies Depression Scale, and the Psychological General Well Being Index – 6^{11,25}.
- CVD-specific screeners for psychological distress include: the Cardiac Depression Scale²⁶, Heart Patients Psychological Questionnaire²⁷ and the Screening Tool for Psychological Distress²⁸.
- Without appropriate screening, depression and anxiety frequently go undiagnosed and untreated, at least in part because some symptoms are typical of the CVD itself and/or medication side effects (e.g., fatigue, insomnia, restlessness)³⁵.

Behavioural Intervention

- Given the role of behavioural factors in patients' recovery from CVD, nonpharmacologic interventions including exercise-based cardiac rehabilitation and mental health treatments are considered important aspects of cardiovascular care.

Cardiac Rehabilitation and Exercise

- Cardiac rehabilitation is the gold standard secondary and tertiary prevention treatment for people with CVD, and CAD in particular^{30,31,32}.

- According to the World Health Organization, cardiac rehabilitation is defined as “the sum of activities required to influence favourably the underlying cause of the disease, as well as to ensure the patients the best possible physical, mental and social conditions so that they may...preserve or resume...as normal a place as possible in the life of the community³³.”
- Exercise is a core component of cardiac rehabilitation. Aerobic exercise has also been evaluated as a treatment for depression in patients with CAD^{34,48}. For example, CAD patients with elevated symptoms of depression who participated in aerobic exercise 3 times per week for four months show improvements in depressed mood comparable to patients randomized to receive antidepressant sertraline, and greater improvements than placebo³⁵.
- Participation in cardiac rehabilitation is cost-effective³⁶ and is associated with significant improvements in mortality/morbidity^{37,38,39,40}, cardiorespiratory fitness⁴¹, CVD risk factors^{38,39,42}, and psychological health outcomes^{38,34,43}.
- Cardiac rehabilitation programs often strive to offer psychological services. In cardiac rehabilitation settings, psychologists can help enhance emotional adjustment (e.g., treatment of depression/anxiety) as well as provide interventions that support health behaviour change (e.g., exercise, weight management, smoking cessation).

Psychological Treatment

- Psychological treatments adapted for CVD patients that have been empirically evaluated include cognitive-behavioural therapy (CBT), psychodynamic therapy, mindfulness-based interventions, supportive counselling, peer support, self-management programs, stress management, problem-solving, skills training, and relaxation therapy (e.g.,^{29,44,45,46}).
- As of 2015, 30 randomized controlled trials were identified that evaluated interventions targeting psychological outcomes in people with CVD⁴⁵. Most studies report beneficial effects on stress, anxiety, depression, and combined anxiety/depression, with medium-to-large effect sizes.
- The effects of psychological intervention on psychological end-points (e.g., depressed mood, anxiety) have been more consistent than effects on biomedical end-points (e.g., CVD morbidity and mortality).

- Cochrane reviews of randomized controlled trials testing heterogeneous psychological treatments for individuals with CVD conclude there may be a modest improvement in cardiac mortality^{29,47}. To date, there is no evidence of significant improvements in overall mortality, revascularization, or nonfatal re-infarction.
- Interventions demonstrated to show favourable outcomes include mindfulness-based interventions, problem-solving, psycho-education (focused on CBT and social learning theories), and stress management therapy. Stress management therapy typically included group-based relaxation strategies, progressive muscle relaxation, and/or aerobic exercise⁴⁵.
- On average, psychological treatments for depressed mood in CAD patients show small but significant effects, according to a review of 64 trials. The highest quality evidence is in favour of CBT⁴⁶.
- Psychological interventions for CAD patients also show favourable effects on physical health parameters including blood pressure, lipid profile, and physical quality of life.^{28,50}
- Under-studied areas of psychological intervention in CVD include: behavioural treatment of sleep disorders, supportive interventions for couples/family members, and behavioural treatments for pain.
- The heterogeneous, multi-component nature of existing psychological interventions, along with poorly described treatment fidelity in some studies, makes it difficult to ascertain the “active ingredients” of successful interventions in CVD populations.
- Importantly, regardless of whether psychological interventions impact CVD morbidity/mortality, it remains important to address psychosocial issues due to detrimental effects on mood and quality of life.

Recommended Resources on the Provision of Psychological Services with CVD Patients

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[E. Callus, E. Quadri, eds., *Clinical Psychology and Congenital Heart Disease: Lifelong Psychological Aspects and Interventions*, Springer, 2015.](#)

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[J.A. Stone, ed., *Canadian guidelines for cardiac rehabilitation and cardiovascular disease prevention: Translating knowledge into action*, 3rd ed., Canadian Association of Cardiac Rehabilitation, Winnipeg, MB, 2009.](#)

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