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Optimising Secondary Prevention and Cardiac Rehabilitation for Atherosclerotic Cardiovascular Disease During the COVID-19 Pandemic: A Position Statement From the Cardiac Society of Australia and New Zealand (CSANZ)[☆]



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Background

The coronavirus disease 2019 (COVID-19) pandemic has introduced a major disruption to the delivery of routine health care across the world. This provides challenges for the use of secondary prevention measures in patients with established atherosclerotic cardiovascular disease (CVD). The aim of this Position Statement is to review the implications for effective delivery of secondary prevention strategies during the COVID-19 pandemic.

Challenges

The COVID-19 pandemic has introduced limitations for many patients to access standard health services such as visits to health care professionals, medications, imaging and blood tests as well as attendance at cardiac rehabilitation. In addition, the pandemic is having an impact on lifestyle habits and mental health. Taken together, this has the potential to adversely impact the ability of practitioners and patients to adhere to treatment guidelines for the prevention of recurrent cardiovascular events.

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Recommendations Every effort should be made to deliver safe, ongoing access to health care professionals and the use of evidenced based therapies in individuals with CVD. An increase in use of a range of electronic health platforms has the potential to transform secondary prevention. Integrating research programs that evaluate the utility of these approaches may provide important insights into how to develop more optimal approaches to secondary prevention beyond the pandemic.

Keywords COVID-19 • Secondary prevention • Cardiac rehabilitation • Atherosclerosis • Cardiovascular disease • Telehealth

Introduction

Human transmission of infection with the novel coronavirus, known as COVID-19, appeared in Wuhan in December 2019 and has rapidly spread to become a global pandemic. The consequent acute respiratory syndrome has placed a considerable strain on health care systems, resulting in significant morbidity and mortality [1]. Even in countries which have been able to limit the number of individuals infected with COVID-19, there has been a seismic shift in traditional platforms for health care delivery in an effort to reduce community transmission [2]. Although the major attention of coronavirus infection from a clinical perspective has focussed on the respiratory complications, there are likely to be considerable cardiovascular implications for those with CVD, and sequelae from the pandemic [2]. Early-stage case fatality rates for those with underlying health conditions in China were highest for CVD (10.5%) and more than ten times that of those without CVD [3]. It is also recognised that up to 20% of patients hospitalised with acute respiratory illness with coronavirus develop either myocarditis, myocardial injury, arrhythmia or venous thromboembolism [2].

However, the potential cardiovascular complications of the pandemic will almost certainly be wide-reaching beyond these direct cardiac effects. Efforts to reduce social contact and community concerns regarding potential transmission have led to reduction in emergency department presentations for acute coronary syndromes by more than 50% [4]. These patients miss the opportunity to receive evidence-based interventions with demonstrated protective effects on future cardiovascular events and death. Furthermore, in the patient with established atherosclerotic CVD, changes in access to the health care system has potential implications for high risk patients to receive secondary prevention strategies. This is important given that patients with coronary heart disease have between 20-35% absolute risk over 5 years of experiencing a new heart attack, stroke or cardiovascular death [5,6], with the greatest risk occurring during the first year following hospitalisation for acute coronary syndrome [7].

Given the concern regarding the long-term cardiovascular sequelae of the coronavirus pandemic, the Cardiac Society of Australia and New Zealand (CSANZ) thought it appropriate to define the potential impact on the effective use of secondary prevention and cardiac rehabilitation and to make recommendations for patients and health care workers. This

‘living document’ reflects the current state of knowledge and recommendations and should be read in conjunction with up-to-date advice from state and federal health departments.

Established Secondary Prevention Approaches

Randomised controlled trials of pharmacological strategies have repeatedly demonstrated reduction in the risk of recurrent cardiovascular events in patients with established CVD. Consequently, the use of antiplatelet, blood pressure, lipid and blood glucose lowering agents, which complement lifestyle modification and attention to psychosocial risk factors are recommended in national and international guidelines [8]. For patients discharged with a recent acute coronary syndrome, referral to cardiac rehabilitation has also been demonstrated to promote medication adherence and more optimal risk factor control. In the COVID-19 setting, optimal uptake and availability of secondary prevention measures is likely to be impaired as patients avoid or are unable to attend in-person medical clinics and rehabilitation programs. Therefore, it is critical to emphasise to both patients and health care professionals that evidence-based routine care works and should continue to be promoted.

This has implications for the continuing use of secondary prevention therapies and attainment of guideline-advocated treatment goals. Accordingly, every effort should be made to lower and manage cholesterol and blood pressure, and use anti-platelet agents, in these high-risk patients, which will require ongoing efforts to maintain adherence with therapy and monitoring of risk factor control. Furthermore, increasing evidence for the benefits of sodium-glucose co-transporter-2 (SGLT2) inhibitors and glucagon-like peptide-1 (GLP-1) receptor agonists in patients with diabetes and established vascular disease supports the need to maximise their use [9]. This guidance to maintain use of evidence-based therapies is particularly important with respect to the use of agents that target the renin angiotensin aldosterone system (RAAS). While the established interaction between the COVID-19 virus and ACE-2 has raised speculation with regard to the impact of the use of RAAS blockers in the setting of COVID-19 viral infection, there is currently no evidence to support the need to stop these agents [10].

Challenges for Secondary Prevention as a Result of the Pandemic

Access to Health Care Workers, Testing and Prescriptions

Medical centres and emergency departments have seen a sharp drop in patients as Australians are worried about the risk of COVID-19 infection at medical clinics [11]. Similarly, patients appear to be avoiding attending pathology collection centres for tests and pharmacies for their medications. Although telehealth services are now more widely available, many patients may not know how to access health care workers via this service. Patients with chronic diseases such as CVD and diabetes can now have Medicare-funded medical consultations by telephone or videoconferencing. This enables doctors to arrange prescriptions to be faxed, and subsequently posted, directly to the patient's chosen pharmacy. Pharmacies in turn can then deliver patient's medicines directly to their home. Similarly, pathology and radiology request forms can be sent directly to pathology collection and radiology centres so patients can have essential tests and monitoring. However, although patients have access to medical advice, testing and medicines, the COVID-19 pandemic is likely to worsen the treatment gap.

Monitoring Risk Factor Control

Despite the evidence base supporting the benefits of intensive lipid lowering, many patients needing secondary prevention are treated with either no or low doses of statin therapy. Maximally tolerated statin doses should be used regardless of the need for lipid testing. Patients may be reluctant to attend either their pharmacy or medical clinic to have their blood pressure measured. Efforts should be made to encourage patients with elevated blood pressure to access a validated blood pressure monitor for home use. Clinics may also be able to lend out such devices or individuals can purchase them independently online or from pharmacies (health care insurance may cover the cost). For disadvantaged patients, additional Government payments to social security, veteran and other income support recipients and eligible concession card holders could cover the cost of a monitor. Similar arrangements can be made to support the use of home glucometer for patients with established type 2 diabetes.

Lifestyle Modification

International guidelines for the care of CVD patients during the COVID-19 pandemic includes advice to address CVD risk factors and promote recovery [12], and cardiac rehabilitation programs have well-established efficacy for supporting patients with lifestyle change [13]. Current social distancing restrictions substantially limit conventional methods of support for lifestyle change such as attending gyms and participating in group exercise programs. On the flip side, social

distancing may also provide an opportunity to focus on positive lifestyle changes. The Heart Foundation provides guidance for health professionals [14], and patient-focussed resources suitable for different levels of health literacy [15].

Smoking presents a significant risk for the CVD patient during the COVID-19 pandemic. In addition to promoting a greater risk of future cardiovascular events [16], smoking also increases the risk of infection via hand-to-mouth contact [17], provides a potential adhesion site for the COVID-19 virus through upregulation of angiotensin-converting enzyme-2 receptors [18], and associates with more severe pulmonary complications [19]. It is also possible that social distancing strategies may increase loneliness and reduce opportunities for positive coping strategies, which may result in greater rates of smoking and relapse in those who have previously quit [20]. It is therefore strongly recommended that all smokers with CVD should be informed of these risks and offered evidence-based assistance to quit, including nicotine replacement therapy and other pharmacological interventions.

Guidelines for exercise and physical activity are unchanged during the context of COVID-19, with general recommendations of 150 minutes per week of at least moderate intensity exercise, including at least two sessions of resistance or strength exercise, with appropriate modifications in the setting of comorbidities [12]. Current social distancing restrictions have afforded increasing opportunities for walking and other forms of exercise within close proximity to home. For those who need to self-isolate at home, efforts should be made to exercise within or outside their residence, making a priority of keeping active through household tasks and avoiding long periods of sitting. Advice and activity plans are available online [17,21,22], with additional support provided through telehealth [23] and use of activity trackers [24]. Engaging household family members can provide additional support for development and maintenance of exercise regimens.

COVID-19 also presents no new dietary recommendations for the CVD patient but is associated with a number of challenges. Social distancing requirements may result in a change to healthy eating routines, including shopping, meal preparation and food choices. Given that poor nutrition and obesity have been identified to associate with poor outcomes in the setting of COVID-19 [25], efforts to maintain a healthy diet are worthwhile. Older or isolated individuals may have limited or no access to grocery stores and may rely on family, neighbours and home delivery services. Those who are particularly vulnerable to poor access to food and need assistance with meal preparation should be referred to relevant local social support organisations for meal delivery, so that nutrition is maintained during the period of isolation.

Mental Health Challenges for Secondary Prevention

Exposure to extreme mental and emotional stress are established cardiovascular risk factors [26,27]. Early evidence of

the direct and indirect psychological consequences of COVID-19, both from the infectious disease and associated public policy is emerging [28]. The current pandemic and social distancing requirements are associated with considerable fear in the community largely due to the evolving nature and uncertainties, particularly where risk of illness and death are substantial [29]. Such anxieties can motivate suboptimal behavioural changes that can shape population cardiovascular health in ways that may have unintended consequences, including disengagement with the health care system or treatment non-adherence.

The excess risk of COVID-19 in patients with CVD may exacerbate emotions such as fear, anxiety, vulnerability, helplessness, hopelessness, trepidation or thoughts of mortality experienced by many following an acute coronary syndrome [30]. Perceived or actual loss commonly results in depression and is more prevalent in CVD patients [31]. Potential financial uncertainty combined with isolation for an unknown or indefinite period, especially the elderly, can induce rumination and maladaptive thought processes and contribute to feelings of loneliness. In China, life satisfaction declined over the COVID-19 outbreak period [32].

Periods of extreme stress including natural disasters or economic hardship present vulnerabilities that can also exacerbate family violence including alcohol, drug taking and financial stressors [33]. Both family violence perpetration and victimisation and maladaptive or dysfunctional relationships directly impact one's cardiovascular system and likely elevate long term CVD risk [34]. Maladaptive behavioural responses such as neuroticism or extreme hypervigilance during infectious disease outbreaks may exaggerate or induce compulsive behaviour. This may include obsessive monitoring of media, social media, hand washing or other compulsive behaviours. Case reports have emerged documenting brief psychotic episodes during the COVID-19 outbreak [35].

Understanding the mental health implications of this pandemic moving into the post-COVID era will also be critical in the context of CVD management. COVID-19 related anxieties or unwillingness to 'burden' the health care system may persist, resulting in continued health service avoidance, disengagement and non-compliance with self-management regimes. This could result in missed cardiovascular or psychiatric medication scripts, referrals to psychologists, specialists or other allied health professionals that promote CVD self-management. Increasing caregiver burden and life events characterised by extreme distress or grief, including relationship breakdown, can increase risk of Takotsubo cardiomyopathy [36].

For those with existing CVD who also develop COVID-19, recovery will need to occur in parallel with ongoing secondary prevention. This has enormous implications for the psychosocial sequelae and rehabilitation of these patients. It has been known that cardiac rehabilitation results in improved psychosocial outcomes [37]. The inclusion of psychosocial interventions as part of routine heart health checks, cardiac rehabilitation, and the promotion of established

mental health services is warranted. Early evidence from China suggests that establishment of external emergency mental health expert teams and provision of online public education, psychological counselling and hotline services may have helped to buffer some of the negative mental health outcomes associated with COVID-19 [28]. The need to expand upon and support these services in the post-COVID era, especially in rural and remote settings, will play a critical part of longer-term CVD management.

Health Care Delivery Platforms for Secondary Prevention

Secondary prevention and ongoing care of patients with CVD must continue during the COVID-19 pandemic. The core elements include assessment, information, individualised care and ongoing support, and these can be delivered via a variety of formats including expansion of telehealth options [38]. Most face-to-face health services and group-programs, including cardiac rehabilitation, have been closed. However, many services have adapted to enable ongoing care and the Australian government has expanded telehealth. Phase 1 cardiac rehabilitation should continue as usual wherever possible, with referral to outpatient programs and follow-up of all those referred for potential attendance at in-person programs when services re-open.

As part of the COVID-19 National Health Plan, the Australian Government has issued a series of temporary Medical Benefits Schedule (MBS) item numbers to help reduce the risk of community transmission of COVID-19 and provide protection for patients and health care providers [39]. There are specific item numbers for telehealth, video-conferencing, telephone consultations and fast-tracked electronic prescribing of medicines. The item numbers are available for use by medical practitioners, nurse practitioners, participating midwives and allied health providers.

Telehealth can make care more accessible and affordable and has the potential to reduce disparities in access to care for rural, regional and remote areas [40], and for vulnerable populations (people with disabilities, Aboriginal and Torres Strait Islanders, the elderly, non-English speaking backgrounds and low socioeconomic groups) [41]. Benefits include: convenience for people in the workforce; reducing transport costs; improved safety through continuous, remote monitoring; increased patient decision-making and self-care; increased access to care; improved medication adherence; and, increased cross-provider communication and potential for integrated care [42].

A recent systematic review found that telehealth secondary prevention can be used instead of, or in combination with, cardiac rehabilitation, and is associated with better risk factor control and fewer clinical events [43]. A range of formats of telehealth delivery, including use of telephone communication, internet websites, smartphone applications [44], and text messaging, have been developed. Examples of these approaches include the telephone-based programs used nationally (The COACH Program [45,46]), and those

directed to patients living in regional and remote areas (CATCH [47]), the TEXTME program [48], and consumer apps for medication adherence and cardiac rehabilitation (e.g. MedApp-CHD [49] and CARDIHAB [50]). Wearable devices, such as activity trackers and smart watches, have demonstrated potential for patients to monitor behaviours such as physical activity and heart rate [51], and are being evaluated with regard to their potential integration into clinical practice.

The National Heart Foundation of Australia also has established programs that enable patients to receive personalised support for heart-healthy lifestyle strategies by telephone or email [52]. This has been complemented by a current media campaign highlighting the need for ongoing attention to prevention measures in those deemed to be at high risk of a cardiovascular event. In parallel, social media has provided an important platform for a range of professional societies to reinforce the need for patients with CVD to continue with secondary prevention.

Recommendations

- The most important message is that patients with existing CVD must continue to receive management and support.
- All recommendations should be applied in conjunction with contemporary advice from Commonwealth and State public health officials.
- Patients with established CVD are at the greatest risk of future cardiovascular events. In the setting of chest pain, recommendations of seeking emergency medical attention remain important.
- All efforts should be made to take advantage of a range of telehealth formats to ensure as many patients as possible have access to health care professionals. Consideration should be made on how best to interact with patients, depending on their access and familiarity with these different technologies.
- Similar e-health strategies should be used to continue to deliver evidenced based therapies to patients in secondary prevention.
- The emergency e-health responses are welcomed, and a strong argument should be to retain these initiatives in practice after the pandemic.
- All preventive therapies should be continued by patients with every effort made to monitor risk factor control. Consideration should be made regarding potential barriers for patients to access prescriptions, imaging, blood tests, blood pressure measurement and referral to cardiac rehabilitation. It has never been more important to avoid under-treatment of patients.
- The inclusion of psychosocial interventions as part of routine heart health checks, cardiac rehabilitation, and the promotion of established mental health services is warranted.
- Consensus statements should support the initiation and use of ACE inhibitors and angiotensin receptor blockers in

CVD patients in the setting of the COVID-19 pandemic unless contrary evidence emerges.

- All patients should receive the influenza vaccine unless they have a specific contraindication to its use.
- In an era of integrating new processes into routine clinical care, there is an important opportunity to evaluate their efficacy and cost effectiveness. This will have implications for their longer-term use beyond the pandemic.

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