

## CSANZ COVID-19 Cardiovascular Nursing Care Consensus Statement

This statement has been prepared by an expert cardiovascular nursing writing group, comprising members of the Cardiovascular Nursing Council and Interventional Nurses Council of the Cardiac Society of Australia and New Zealand (CSANZ).

**Sally C Inglis** RN BN BHSc(Hons) PhD FCSANZ<sup>1</sup>, **Carolyn Naismith** RN MN<sup>2</sup>, **Kevin White** RN<sup>3</sup>, **Jeroen M Hendriks** RN MSc PhD FESC FCSANZ<sup>4</sup>, **Janet Bray** RN PhD FAHA<sup>5</sup>, **Louise Hickman** RN MPH PhD<sup>1</sup>, **Chris Aldridge** NP<sup>6</sup>, **Kimberley Bardsley** NP<sup>7</sup>, **Jan Cameron** RN BN PhD<sup>8</sup>, **Dion Candelaria** RN, GradCert (Cardiovasc), MN PhD Candidate<sup>9</sup>, **Susie Cartledge** RN BN(Hons) PhD FESC<sup>10</sup>, **Huiyun Du** RN BN(Hons) PhD<sup>10</sup>, **Caleb Ferguson** RN BSc MHLth PhD FESC FCSANZ<sup>11</sup>, **Lorelle Martin** RN RN MNsc PhD Candidate<sup>2</sup>, **Terina Selkow** NP<sup>12</sup>, **Xiaoyue Xu** BN MSc MPH PhD<sup>1</sup>, **Rochelle Wynne** RN Grad Cert Appl Sci (Stats) Grad Dip Crit Care MEd PhD<sup>11,13</sup>, **Andrea Driscoll** NP PhD FAHA FCSANZ<sup>13,2,5</sup>, **Robyn Gallagher** RN BA MN PhD FAHA FESC FCSANZ<sup>9</sup>, **Robyn Clark** RN RM ICUcert DipAppliSci BN MEd PhD ACCCN (Life Member) FCNA FAHA FCSANZ<sup>10</sup>, **Patricia M. Davidson** RN MN MEd PhD FAAN<sup>14</sup>

1. IMPACCT, Faculty of Health, University of Technology Sydney, Sydney, Australia. 2. Department of Cardiology, Austin Health, Melbourne, Australia; 3. MonashHeart, Melbourne, Australia; 4. College of Nursing and Health Sciences, Flinders University; Centre for Heart Rhythm Disorders, University of Adelaide; Department of Cardiology, Royal Adelaide Hospital, Adelaide, Australia; 5. Epidemiology and Preventative Medicine, Monash University, Melbourne, Australia; 6. Middlemore Hospital, Counties Manukau District Health Board, Auckland New Zealand; 7. The Prince Charles Hospital, Chermside, Queensland, Australia; 8. Faculty of Medicine, Nursing and Health Sciences, Monash University, Melbourne, Australia; 9. Susan Wakil School of Nursing and Midwifery, & Charles Perkins Centre, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia; 10. College of Nursing and Health Sciences, Flinders University; 11. Western Sydney Nursing & Midwifery Research Centre, Western Sydney University & Western Sydney Local Health District, Blacktown Hospital, Blacktown, Australia; 12. Bundaberg Hospital, Bundaberg, Queensland, Australia; 13. Centre for Quality and Patient Safety, School of Nursing and Midwifery, Deakin University, Geelong, Australia; 14. School of Nursing, Johns Hopkins University, Baltimore, United States of America

This information is intended to support cardiovascular nurses in reducing the risk for virus transmission when delivering comprehensive nursing care during the COVID-19 pandemic; to adapt and transition to alternative models of care during the pandemic; and to be aware of the cardiovascular implications of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

This document should be read alongside other key documents prepared by the Cardiac Society of Australia and New Zealand (CSANZ), in particular the [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#), position statements authored by other CSANZ Councils and Working Groups (see [www.csanz.edu.au](http://www.csanz.edu.au)) and the Australian Federal Government as well as relevant State and Territory Government advice and guidelines, especially the Cochrane Living Guidelines Caring for people with COVID-19: <https://covid19evidence.net.au/>. To ensure updated and appropriate guidelines are followed, we encourage regular review of these documents online to ensure the most current version is referred to.

This statement was authored by leading clinical and academic nursing leaders. It has been reviewed by a healthcare consumer. It has been developed through consensus, referring to the best available evidence and guidelines at the time (with preference to Australian Federal, State sources and leading Australian and New Zealand health organisation documentation). It should be considered in relation to your local context, your patient population, healthcare service and the jurisdiction and scope in which you practice.

All nurses providing care to patients with cardiovascular disease (CVD) play a critical role in the prevention, diagnosis and management of heart disease and other cardiovascular conditions.

Cardiovascular nursing care is provided in a wide range of settings from critical care, cardiac catheter laboratories, cardiology wards, outpatient clinics and primary and community care.

During the COVID-19 pandemic providing cardiovascular care for patients is vital, however a rapid move has been undertaken to implement phone contact and/or telehealth (Neubeck et al 2020; Cleland et al 2020).

In [Australia](#) and [internationally](#) acute cardiovascular presentations to hospital have declined substantially, causing significant concern that patients are [avoiding seeking care](#). The toll of COVID-19 will be much higher, particularly if individuals face increased disability through not accessible treatments for heart attack and stroke.

**Table 1 Key issues relevant to cardiovascular nursing care.**

Key issues relevant to cardiovascular nursing care	
1	Reduce/minimise transmission of SARS-CoV-2 virus . <u>Always</u> wear the appropriate PPE
2	Patients with pre-existing cardiovascular disease have higher morbidity and mortality due to SARS-CoV-2 virus
3	Acute cardiovascular manifestations of SARS-CoV-2 virus include myocarditis, heart failure, arrhythmias and myocardial infarction
4	Be aware of delays in seeking care and avoiding healthcare during the pandemic
5	Medications used to treat SARS-CoV-2 virus may be associated with long QT and arrhythmias
6	Where possible, transition to remotely-provided care and adapt models of care and protocols in alignment with current Federal and State government recommendations
7	Providing patient self-care management education relevant to COVID-19
8	Early conversations regarding advanced care planning and end of life care are especially important
9	Practice self-care for yourself and support self-care of your colleagues

## 1. Reduce/minimise transmission of the SARS-CoV-2 virus to health care workers and to non-infected patients

The coronavirus-19 disease (COVID-19) pandemic is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Zhou P et al. 2020). Global spread of COVID-19 underscores the importance of taking actions to reduce and minimise transmission.

Health care workers are at high risk of infection (Wang J et al. 2020; Wu Z et al. 2020). All possible precautions to reduce the risk of transmission to healthcare workers should be taken at all times and the appropriate personal protective equipment (PPE) should be accessible and used at all times.

Patients with pre-existing cardiovascular disease have a higher morbidity and mortality due to SARS-CoV-2 and precautions must be taken to avoid transmission to this at-risk population.

The [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#) outlines signs and symptoms and radiological features which may indicate COVID-19 infection. These clinical indicators and risk factors may change overtime as the pandemic evolves.

Please check [Australian Government Department of Health](#) for updated advice on COVID-19 testing as these may vary according to local area and setting. Testing is widely available and should be accessed without delay.

Refer to [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#) for advice on when to employ rapid testing (where available) as a screening tool prior to admission or undertaking a cardiac procedure.

The following CSANZ publications provide advice on specific cardiovascular admissions, procedures and investigations and the precautions to be taken. Additional statements may become available. All CSANZ publications and statements related to COVID-19 can be found online ([www.csanz.edu.au](http://www.csanz.edu.au)).

- [CSANZ Position Statement on the management of cardiac electrophysiology and cardiac implantable electronic devices in Australia during the COVID-19 Pandemic: a living document](#)
- [CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#)
- [CSANZ Position Statement COVID-19 and acute heart failure: screening the critically ill](#)
- [CSANZ Consensus statement for patients with genetic heart disease and COVID-19](#)

Guidance here is taken from the [Australian Federal Government PPE Guidelines](#) and the [Australian and New Zealand Intensive Care Society Coronavirus Guidelines](#). Further guidance on the management of COVID-19 patients is provided in the Cochrane Living Guidelines Caring for people with COVID-19: <https://covid19evidence.net.au/>

Summaries of evidence for hand hygiene (including [washing](#) and [alcohol-based solutions](#)) and PPE (including [washing](#) and [alcohol-based solutions](#)), PPE ([non-sterile gloves](#), [face masks and respirators](#), [gowns](#)) produced by [Johanna Briggs Institute](#) can be found online.

Support your local institutions guidelines and protocols particularly by:

- Practicing routine [hand hygiene](#) (see [World Health Organization](#) resources)
- Diligently avoiding touching the eyes, nose or mouth with unwashed hands
- Ensuring correct use of Personal Protective Equipment (PPE) every time
  - [PPE](#) to be worn by staff [inside the Cardiac Catheter Lab \(CCL\)](#), cardiac surgery theatres and for all potentially aerosol-generating procedures/situations includes:
    - Hat
    - N95 mask
    - Goggles/ or face shield
    - Gown
    - Gloves
    - Boot covers
- Practice social (physical) distancing by at least 1.5m, as much as practically possible with fellow staff, patients and other individuals present in your work environment

- Clean equipment in between every patient use especially telemetry units, monitoring leads, ECG machines, BP cuffs, BGL machines, resuscitation equipment. Follow your institution infection control guidelines in terms of how to clean and what cleaning/disinfectant preparations to use
- Dispose of equipment according to COVID-19 infection control guidelines, manufacturer's recommendations and local guidelines
- Plan workflow and routes for patient transfers between key cardiac and critical care service areas with consideration given to:
  - The transfer of patients should be minimised whenever possible
  - Minimising contact with other patients and staff
  - Entry to a patient's room should be limited to vital staff
  - A separate member of the transport team to open doors and maintain distancing
  - Consider if a required procedure can be safely done at the patient's bedside, if patient is suspected or confirmed COVID-19 to minimise transmission risk
  - Non-intubated patients should be transferred wearing a surgical mask over their oxygen delivery device

- Ensuring awareness and compliance with changes to MET and code blue responses to ensure adequate care but to minimise staff exposure. These are addressed in the [ANZICS COVID-19 Guidelines](#) and the [Australian](#) or [New Zealand Resuscitation Guidelines](#)

Current recommendations include all staff should wear airborne PPE, including an N95 mask, before commencing chest compressions. However, these guidelines may be updated and require regular review.

It is currently unclear if defibrillation creates aerosols, [ILCOR](#) suggest it may be reasonable for healthcare providers to consider defibrillation before donning PPE in situations where the provider assesses the benefits may exceed the risks

- In the out-of-hospital setting, follow the local [Australian](#) or [New Zealand Resuscitation Guidelines](#) and COVID-19 recommendations by [ILCOR](#)
- All hospitalised patients during the COVID-19 pandemic should have a clearly documented plan of management in case of clinical deterioration as outlined in the [ANZICS COVID-19 Guidelines](#)
- Consider utilising alternative workforce models that minimise healthcare worker interactions and the need for isolation if exposed to COVID-19. [ANZICS COVID-19 Guidelines](#) recommend care delivery in small set teams
- Ensuring staff who are unwell follow federal and state public health guidelines in regard to self-isolation and testing for COVID-19
- Ensuring a good communication strategy is in place to inform staff of new developments and changes which may occur rapidly. This should be informed by your institution crisis communication and management plan

Further guidance on protecting cardiovascular healthcare workers and patients is provided in the CSANZ statements authored by other CSANZ Councils and Working Groups (see [www.csanz.edu.au](http://www.csanz.edu.au)).

Further guidance on the management of COVID-19 patients is provided in the Cochrane Living Guidelines Caring for people with COVID-19: <https://covid19evidence.net.au/>

Further guidance on MET and Code Blue Management is provided in the ANZICS COVID-19 Guideline <https://www.anzics.com.au/coronavirus-guidelines/>

## 2. Patients with pre-existing cardiovascular disease have higher morbidity and mortality due to COVID-19

The [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#) underscores the increased risk of severe disease and death for patients with pre-existing cardiovascular disease.

Population groups with higher rates of pre-existing cardiovascular disease, such as [Indigenous people, and those in rural and remote areas are at higher risk of poor outcomes](#). These communities and the local healthcare system may experience disproportionate burden of severe and fatal cases of COVID-19.

A meta-analysis of eight studies from China has determined that cardiovascular disease carried the highest odds for severe disease and poor outcomes rather than mild disease (Yang J et al. 2020). Patients with cardiovascular disease were nearly three and a half times more likely to develop severe disease (Odds Ratio 3.42, 95% CI 1.88-6.22) and case-fatality was five times the overall COVID-19 case fatality rate of 2.3% (see Table 2).

Data from Italy, where the overall COVID-19 case-fatality rate was the highest reported to date worldwide at 12.8% has reported a high prevalence of ischaemic heart disease in fatal cases of COVID-19 (Onder G et al, 2020).

**Table 2.** Case fatality rates of patients in China with COVID-19 (Yang J et al. 2020) adapted from [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#)]

Condition	Case fatality rates (CFR)
Cardiovascular disease	10.5%
Diabetes	7.3%
Chronic respiratory disease	6.3%
Hypertension	6.0%
Cancer	5.6%
No comorbidities	0.9%
Overall case-fatality rate	2.3%

Knowledge and understanding of the pathophysiology of COVID-19 is continually expanding. It is understood that the SARS-CoV-2 virus enters cells via binding to the angiotensin-converting enzyme 2 (ACE2) receptors found in the lungs and heart (Hoffman M et al. 2020) and that the ACE-2 system plays an important role in the severity of COVID-19 (Fang L et al. 2020).

The [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#) strongly recommends that ACE inhibitors and ARBs should be continued as indicated.

[Smoking presents a particularly elevated risk to patients](#). Smoking increases hand to mouth contact, putting people who smoke at greater risk of transmission and infection. Smoking increases the severity of respiratory infections (Brake SJ et al. 2020)

Quitting smoking delivers health benefits in both the short and long-term and should be encouraged for all cardiovascular patients who smoke. [The Cochrane Collaboration](#) as curated a special collection of Cochrane Reviews on effective options for quitting smoking during the COVID-19 pandemic.

### 3. Acute cardiovascular manifestations of COVID-19

Cardiovascular sequelae of SARS-CoV-2 infection, resulting in acute cardiac injury may present as left ventricular (LV) dysfunction, ventricular arrhythmias, ECG changes, elevated B-type natriuretic peptide (BNP) and elevated troponin and other cardiovascular biomarkers. Detailed discussion of the cardiovascular sequelae of SARS-CoV-2 infection is provided in the [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#).

The nursing implications are that SARS-CoV-2 infection patients with cardiovascular sequelae may not be referred appropriately to cardiac care and integrated care across all systems. We must ensure that SARS-CoV-2 infection patients with cardiovascular sequelae receive appropriate cardiac care and secondary prevention management.

### 4. Delays in seeking treatment during the pandemic

[Ambulance and emergency department data](#) from Australia highlights a significant decline in emergency presentations for cardiovascular emergencies, including myocardial infarction, chest pain and stroke. This trend has also been reported [internationally](#). Significant declines in the rates of ST elevation myocardial infarction (STEMI) have been [reported](#) (70% reduction in the north of Italy, 40% in Spain, and up to 50% across the United States), along with increases in out of hospital cardiac arrests (Allahwala et al. 2020). Although there are many theories regarding these declines, such changes in physical activity and lifestyle due to staying at home, however, at this time, it is most important to focus on educating patients of the need to seek treatment in an emergency and to regularly access healthcare for ongoing care. As cardiovascular nurses we recognise that timely treatment for heart attack and stroke is critical.

We need to promote messages, particularly in the media, that the health system is ready, willing and able to treat these life threatening conditions.

Research conducted before the pandemic indicates that many factors influence care-seeking delay or avoidance (Ivynian SE et al. 2020). During the pandemic delays in seeking care or avoiding healthcare [may be](#) occurring due to fear of exposure to COVID-19, not wanting to burden the healthcare system or perhaps misunderstanding the public health messaging about staying at home. This is a worrying trend and will lead to significant morbidity and mortality among cardiovascular patients if this is a persistent trend throughout the pandemic.

There are justifiable concerns that there will be a surge of cardiovascular patients who have been tolerating increasing symptoms at home and will over the coming months, present with complications of untreated coronary disease, heart failure, arrhythmias and valvular heart disease (Allahwala et al. 2020). Just as the healthcare system has prepared for a surge in cases of COVID-19, we must also ensure we are prepared for a potential influx of complicated presentations in our cardiovascular patients.

Be aware of these factors and encourage patients to call 000 (111 in New Zealand) for every cardiovascular emergency whilst at home.

### 5. Medications used to treat COVID-19 may be associated with long QT and arrhythmias

In the absence of a vaccine, numerous clinical trials for treatment for COVID-19 are being conducted internationally. Trials underway are investigating the efficacy (alone or in combination) of hydroxychloroquine, azithromycin and ritonavir/lopinavir to treat COVID-19. Some of these medications

can cause cardiac toxicity, specifically QTc prolongation and Torsades De Pointes, especially in patients with hepatic or renal impairment (please see [Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#)).

As a result of the interest in hydroxychloroquine, off label prescribing has occurred locally and health professionals, especially those assessing presentations of arrhythmias should be alert to cardiac toxicity presenting in the community members related to its use.

All nurses who provide care to patients with CVD play a critical role in this area by:

- 1) Continuing to reduce anxiety about future cures for COVID-19 and setting realistic expectations;
- 2) Providing education about the danger of CVD patients using off label medications and;
- 3) Continuing to reiterate the quality use of medications and always seeking expert advice from their nurse, pharmacist or doctor.

## 6. Adapting to new models, protocols for cardiovascular care

### Acute care – Cardiac Catheterisation Laboratory

Guidance here is taken from [CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#), with additional evidence and guidance from published scientific literature.

General considerations for CCL use during COVID-19 pandemic, as per [CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#):

- Determine patient's COVID-19 status (see Section 1 above)
- When available consider rapid point of care testing, if unable to obtain history (e.g. intubated patient) consider the patient to be at-risk
- For all confirmed/suspected COVID-19 cases:
  - Patient - surgical/medical mask if not intubated
  - PPE for all CCL staff including aerosol protection (N95 mask) given risk of emergent intubation/CPR/vomiting in STEMI (aerosol generating procedures)
- Patients approaching/requiring intubation should have this performed prior to transfer to CCL as intubation/suction/active CPR all increase aerosolisation of respiratory secretions
- Designated COVID-19 CCL's that are cleared of non-essential equipment/stock to facilitate cleaning. Consider dedicated, in the CCL, stock for COVID-19 patients
- Number of staff required to be in the CCL should be limited to essential personnel only e.g.: Cardiologist, scrub assistant, scout nurse
- Minimise or abolish staff movements in and out of the CCL during the case
- Instituting a dedicated nurse role outside the CCL to allow for passing equipment and medication, coordination of destination teams for transfer, facilitating correct use of PPE and ensure adherence to infection control protocols
- A terminal clean following the procedure will be required, potentially delaying subsequent cases

[CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#) advise that traditional care models and pathways of transfer for these critically ill patients in and out of the CCL will need to be adapted to minimise staff exposure and optimise safety.

During the COVID-19 pandemic delays in transferring patients to and from the CCL may occur. Clinical teams should take time to make appropriate decisions and to prepare for safe transfer. It is essential that the availability of the CCL is confirmed prior to transfer.

Clear communication is an important strategy to minimize cross contamination risk for other patients. Clearing the CCL post procedure and allowing clinical teams time to prepare the lab and don PPE correctly to receive the patient (Welt FP et al. 2020).

[Australian PPE Guidelines](#) advise that due to the risk of sudden clinical deterioration and cardiac arrest it is recommended that patients with STEMI are risk stratified as medium to high risk for COVID-19 and the appropriate PPE standards should be maintained to minimize staff risk.

Close collaboration with ED, ICU and Anaesthetics to plan for cardiac emergencies is important to optimise patient outcomes and reduce staff anxiety. Simulation of modified pathways for cardiac emergencies, expedited STEMI transfer to the lab and transfer to the critical care unit post procedure is a valuable tool to minimize transfer delays and increase staff proficiency and confidence in modified pathways minimizing risk to both the patient and the clinical staff ([International Society for Rapid Response Systems](#)).

According to the [CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#) at times when the CCL is unavailable thrombolysis may be considered as an alternative if clinically indicated. Rural and regional centres have well established pre-hospital thrombolysis management systems that demonstrate positive outcomes for patients. Adapting these protocols will be required in the acute tertiary hospitals as an alternative if the CCL is unavailable ([NSW Agency for Clinical Innovation](#)). This change would require a comprehensive local education strategy for acute cardiac nurses and close collaboration with pharmaceutical services to ensure appropriate stock levels are maintained to facilitate access to this treatment option.

### **Key principles for cardiac catheter lab procedure management**

All STEMI patients transferred to the CCL should be managed using full [PPE equipment in accordance with COVID-19 and Aerosol Generating Procedures Guidelines](#) due to the potential risk of sudden deterioration and the need for high flow oxygen and/or intubation in this critically ill cohort.

The following key principles should be considered for setup and management of procedures in the CCL environment for COVID-19 confirmed or suspected cases during the pandemic:

- If possible one CCL should be dedicated to STEMI cases
- The CCL staff should be divided into two teams
- [PPE to be worn by staff](#) inside the CCL includes:
  - Hat
  - N95 mask
  - Goggles/ or face shield
  - Gown
  - Gloves
  - Boot covers

### **Modifications to clinical team roles - TEAM inside CCL**

Guidance here is taken from [CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#), with additional evidence and guidance from published scientific literature (Romaguera R et al. 2020; Szerlip M et al. 2020).



The team inside the CCL should be kept to a minimum and it is strongly recommended that all non-essential and inexperienced staff are kept outside of the CCL to minimise cross contamination risk.

Consideration should be given to minimising the team to the following members:

- Interventional cardiologist
- Scrub nurse
- Scout nurse

***The interventional cardiologist and scrub nurse:***

Both will maintain their usual role.

***Scout nurse***

Consideration should be given to making the scout nurse the TEAM LEADER to due to the increased workload for personnel in the CCL due to minimising the number of staff in the CCL. In addition to regular duties the scout nurse will undertake some duties that may be traditionally performed by the cardiac physiologist or the radiographer to minimise the number of people in the room. These include:

- Apply and connect the ECG, defibrillator pads and monitoring equipment
- Apply a Hudson mask at 6L O2 only if the patients O2 saturation falls below 94% (Stub D, et al. 2015) and respiratory rate exceeds 20 breaths per minute as [high flow oxygen 6Ltr or above this is considered to be aerosol generating](#)
- Ensure all personal inside the CCL have appropriate PPE and are using it appropriately, including supervising the correct removal processes.

**TEAM supporting procedure outside the CCL**

It is essential that the supporting team **DO NOT** enter the CCL at all.

The in- CCL team will transfer the patient to the table with the assistance of the transferring unit who have already had patient contact (eg: paramedic / ED staff), to minimise cross contamination risk.

The team outside the lab will include:

- Scout nurse-runner
- Cardiac physiologist
- Radiographer
- Registrar/Interventional fellow

***Scout nurse-runner***

This role may have to move into the CCL depending on the location of sterile stock and medications within your department. If the scout nurse-runner is inside the CCL then the functions of this role will transfer to the registrar/fellow. Responsibilities include:

- Keeping unnecessary staff out of the CCL
- Passing equipment/ medication stored outside the CCL as required
- Liaising with the destination location/ other parties re: transfer
- Liaising with relatives
- Assisting Registrar and Code Blue team with PPE equipment if required

***Cardiac Physiologist***

The Cardiac Technologist will remain outside the CCL and in addition to regular duties will include:

- Ensure all paper records remain outside the CCL
- Document medications for scout nurse to sign off at the end of case

**Registrar/Interventional Fellow**

If CPR is required, the Registrar/Fellow may enter the CCL with correct PPE to commence compressions until the Code team arrives to assist with the airway management if required.

**Case Completion and Transfer to Critical Care Ward**

Guidance here is taken from [CSANZ Consensus Guidelines for interventional cardiology services delivery during COVID-19 pandemic in Australia and New Zealand](#), with additional evidence and guidance from published scientific literature (Welt FG, et al. 2020; International Society of Rapid Response Systems and Critical Care Outreach, 2020).

At the completion of the case the receiving ward staff, CCU or ICU staff will assist with the transfer of the patient from the table to the bed and receive handover.

The Team Leader will:

- Ensure receiving staff are wearing appropriate PPE
- Handover patient to receiving nurse
- Supervise the correct removal and disposal of PPE and that all staff wash hands as they leave

The scrub nurse will

- Ensure correct disposal of procedural equipment
- Wipe down monitoring equipment/ leads with approved cleaning solution prior to terminal clean

The procedural cardiologist will

- Handover to medical team if required
- Remove PPE in the recommended manner and wash hands before leaving the CCL
- Complete the report

The scout nurse-runner/registrar/fellow will:

- Call the cleaning team and arrange terminal clean according to local institutional protocols for cleaning, including time for droplets to settle.

**Acute care in the cardiac unit**

The inpatient acute cardiac unit may be challenged in response to COVID-19 and should be prepared to plan for the following:

- Redeployment of acute cardiac care nurses to critical care/ICU/ED  
Acute cardiac care RNs possess competencies that position them to assist in the delivery of care in ICU and high dependency units. Additional online training to upskill 20,000 RNs [funded by the Federal Government](#) has assisted in expanding critical care workforce capacity.
- Administration of thrombolysis for management of STEMI  
Existing policies and procedures should be revisited, and clinical educators must ensure that staff education and competencies are current.
- Preserving hospital bed capacity for cardiac emergencies
- Minimising COVID-19 transmission to high risk patients with significant co-morbidities
- Access to [vital PPE equipment, including PPE for aerosol generating procedures](#) and other high risk clinical care and be trained in the donning and doffing of PPE

- Admission of patients with complicated presentations of [acute cardiac events due to delays](#) in calling 000 (111 in New Zealand) or presenting to hospital
- Increased levels of anxiety amongst patients, especially if family members are unable to visit
- Roster changes for wards to support team-based nursing
- Supervision of third tier health workers and student nurses and those who are returning to the workforce to increase capacity during the COVID-19 pandemic
- All nurses who are first responders on rapid response teams (RRTs) should plan locally and outline their role in the assessment, triage and management of clinically deteriorating patients. This may change if ICU staff are overwhelmed by critically ill COVID-19 cases or are themselves unwell due to illness
- Minimising length of stay in acute settings by supporting strategies for safe early discharge (see Outpatient and Community Management section below)
- Providing expert education, support and communication for patients and families using phone follow-up or novel technologies such to enable video-conference meetings and telehealth.

### **Outpatient and Community Management**

Patients who are reviewed through a cardiovascular outpatient clinic or community-based program will require ongoing care through the pandemic. Where face-to-face services (home visits, clinics) have been suspended, alternative models of follow-up may have been implemented.

The principal aim of management is to maintain contact with patients to keep them stable, monitoring for any signs of deterioration and manage adjustments to their care remotely via phone contact or where available, telehealth systems.

The [Australian Heart Failure Guidelines](#) support the use of telemonitoring and structured telephone support for people with heart failure, which is informed by [Cochrane Review evidence](#). The [Australian Atrial Fibrillation Guidelines](#) also support the use of telehealth, preferably and where possible, within an integrated care approach.

The benefit of telehealth consultation (compared to telephone-only contact) is the ability to see the patient and their surroundings. We acknowledge that not all health services are able to provide these services and it is most important to focus on maintaining contact with patients, collecting information verbally and providing tailored supportive advice and care to the patient (Neubeck et al 2020).

Nurse Practitioners may be able to access temporary MBS telehealth items. Details are available at [MBS Online](#).

The [Australian Government Department of Health](#) provides the following advice regarding selecting suitable web/video conferencing solutions for telehealth consultations: *“Practitioners must ensure that their chosen telecommunications solution meets their clinical requirements and satisfies privacy laws. Information on how to select a web conferencing solution is available on the [Australian Cyber Security Centre website](#)”*.

It is important to remember overall privacy requirements and to obtain patient’s understanding and consent before proceeding to deliver care via a phone call or telehealth.

There are leading nursing experts in cardiovascular telehealth in Australia and New Zealand, if further support is required, please refer to the contact list at the end of this document.

Successful implementation of remote outpatient and community management requires:

- Assessment of the patient's access and skills to utilise information communication technology and tools to assist with remote monitoring of the patient's condition (access to a telephone, smart phone/tablet/computer to allow video calls, if this is the mode of delivery; home blood pressure monitor; reliable and clear to read set of scales (or Bluetooth enabled) to assess weight; and applications using photoplethysmography via a smart phone to assess heart rhythm).

Where possible, arrange access to these tools as required. If clinically indicated, and permitted by your local institution provide access to additional monitoring equipment.

- In patients with diagnosed arrhythmias such as atrial fibrillation (AF), it may be important to (remote) monitor heart rhythm and rate.

The absence of an ECG while providing telephone or telehealth consultation makes assessment of the patient's clinical condition as well as determining appropriate treatment challenging.

Smart phone apps using photoplethysmography (PPG) provide an opportunity to assess heart rhythm and heart rate, but require the patient to have access to the technology (smart phone with light and PPG app installed) as well as being able to perform the assessment with (if family or carer can assist) or without assistance as to transmit the reading to the clinician. This takes some skill on behalf of the patient but there is [evidence](#) to [support](#) its use.

A real-world example of an AF management program utilising this technology is provided below.

- Consider the patient's ability to utilise technology and preferences for communication mode and frequency.
- Provide reassurance to the patient that they are still being cared for and monitored, just in a different manner.
- Health services have developed telephone scripts to assist clinicians with their phone or telehealth consultations. These are available on your health service intranet. NSW Agency for Clinical Innovation has [guidance](#) on conducting telehealth calls.
- Record accurate and detailed nursing notes following each phone call/telehealth consultation. This will be especially important if 'regular' nursing staff are deployed to other clinical areas during the pandemic and outpatient services are staffed by those who may be less familiar with the patients for whom they are caring for and usual clinical protocols.
- Provide patient education (through phone calls and perhaps emails in addition to phone calls) to explain the use of the technology, and why patient's adherence to this is important in this case. It is also important to mail hard copies of these educational resources to patients.
- Provide follow-up calls to reassure patients as well as to keep them engaged and motivated in order to maintain their self-management (i.e. following instructions /using technology).
- Investigate what options exist in your area for GP's or community health services to assist with monitoring patients – ECG, BP monitoring, respiratory assessment, pathology, general medical and nursing assessment (when required) in partnership with hospital-based outpatient services.
- Familiarise your team with programs available to support patients at home. Assess what support the patient has for access to food, meal preparation and emergency contacts. Refer patient to relevant sources of information as required to support them.
- Familiarise your team to options available to accommodate regular medications, such as medication titration and use of the [Home Prescription Service \(Australia\)](#) for eligible patients and home-based pathology collection programs.

### Example of adaption of face to face outpatient service to telehealth model in Europe during the COVID-19 pandemic – [TeleCheck-AF](#)

TeleCheck-AF has been developed by Prof Jeroen Hendriks, in collaboration with A/Prof Dominik Linz and Ms Nikki Pluymaekers and the TeleCheck-AF team at the Maastricht University Medical Centre+, Maastricht, The Netherlands

[TeleCheck-AF](#) is an on-demand app-based heart rate and rhythm monitoring infrastructure for the management of AF through teleconsultation. This infrastructure was rapidly established during the COVID-19 pandemic. More information is available [online](#).

The approach maintains comprehensive AF management and incorporates three fundamental components:

- 1) **Structured teleconsultations- (Tele):** Face to face outpatient consultations were transformed into teleconsultations allowing health care professionals to conduct remote consultations with AF patients, whilst preventing them coming to the hospital.
- 2) **On-demand symptom, heart rate and rhythm monitoring infrastructure:** Patients were instructed to download a validated app (Fibrichck® Proesmans T et al. 2019; O’Sullivan JW et al. 2020) on their mobile phone. The app (Fibrichck® - not able to be used in Australia yet) uses photoplethysmography and is validated to detect AF with a sensitivity of 96% and specificity of 97%. The app is CE (approved in Europe) marked and connected to a secured and certified cloud where the data is stored. The patient is instructed to perform three measures a day (and additional measures in case of symptoms) by putting a finger on the built-in phone camera for 60 seconds, during 7 consecutive days prior to the teleconsultation. Patients also assess their symptoms, weight and blood pressure.
- 3) **Comprehensive AF management:** According to the [AF guidelines](#), the management of AF consists of four main domains: i) rate control for symptom management and preservation of left ventricular function, ii) rhythm control to improve symptoms, iii) prescribing appropriate oral anticoagulation according to stroke risk to prevent thromboembolic complications, and iv) management of precipitating factors (i.e. underlying cardiovascular conditions and modifiable risk factors) to reduce the cardiovascular burden. This comprehensive approach can be provided through the teleconsultations.

#### Practice points of TeleCheck-AF

Besides utilising an mHealth intervention, [TeleCheck-AF](#) includes fundamental aspects of an integrated care approach as recommended in the [guidelines for the management of AF](#) :

- Active patient involvement: patients are ‘in charge of their own care’ by asking them to provide vital data in order to determine optimal treatment. To achieve this, it is important to engage with the patient and provide clear education and instructions.
- Multidisciplinary team approach: Teleconsultations can be embedded in an existing AF-clinic in which a multidisciplinary team (i.e. those specialists that can be involved in AF treatment) may provide the care. Also, this collaborative practice model may further integrate collaboration and communication between specialized hospital care and primary care services, with significant roles for nurses and allied professions.
- Comprehensive treatment and access to all treatment options: aiming to cover all AF treatment domains as outlined above. However, composition and content of domains will be based on the individual patient situation.

## **Cardiac rehabilitation**

The [CSANZ Secondary Prevention Position Statement: Initiation and Maintenance of Lifestyle Behaviours for Cardiovascular Disease Patients During COVID19 Pandemic Restrictions](#) also provides information and detail regarding managing secondary prevention care.

With the suspension of face-to-face cardiac rehabilitation services there is an important opportunity to implement, evaluate and adapt alternative models of delivery of secondary prevention programs (Thomas et al 2020).

Cardiac rehabilitation providers may be concerned that telehealth and digital delivery may not be as effective for their patients, but they should not be concerned. For instance, traditional face-to-face comprehensive [cardiac rehabilitation programs](#) may have well-established effectiveness for reducing mortality and readmissions, but participation in these programs is poor (Peters et al 2017), so many cardiac patients miss out and there is now an opportunity to address these groups as well. Furthermore, telehealth-delivered cardiac rehabilitation effectively reduces cardiac readmissions, total cholesterol, low-density lipoprotein and smoking (Jin et al 2019) and does so just as effectively as face-to-face programs (Clark et al 2015).

There are lots of open access, free, web and app-based resources available for nurses to choose from, but the choice should be based on the needs of your patients in your local context.

A list of good quality resources are provided below:

- Cardiac College is an online 12 week workbook resource specifically designed for cardiac rehabilitation by the Toronto University Health Network  
<https://www.healthuniversity.ca/en/cardiacollege>
- The Heart Foundation provides excellent resources following heart events such as myocardial infarction, which includes extensive cardiac rehabilitation advice  
<https://www.heartfoundation.org.au/after-my-heart-attack>
- The British Heart Foundation provides exercise guidance and demonstrations  
<https://www.youtube.com/watch?v=O5YX5xg8Seg> and  
[https://www.youtube.com/watch?v=NWRI2D\\_vb8g](https://www.youtube.com/watch?v=NWRI2D_vb8g)
- MyHeartMate is an Australian, research developed, game-based app is available free on the app store (Gallagher et al 2019)
- St Vincent's Hospital Sydney provides a series of videos from the multidisciplinary team  
<https://www.svhhearthealth.com.au/rehabilitation/overview-rehabilitation>
- The Australian Centre for Heart Health provides [online support programs](#) including: Back on track a 5-week online program to help get people get back on track after heart attack or cardiac surgery (Higgins et al 2017). Teleheart a telephone delivered program to support behavioural and emotional recovery; a cardiac counselling clinic with online psychological support.

There are many resources to enable you to develop and schedule your own telephone-based and/or virtual patient assessments, advice and group sessions. Land-line telephones, email, smartphone-based and videoconferencing can all be used. However, the availability and capacity of in-house technology such as built-in or add-on cameras for virtual meetings and internet access will determine the type of delivery.

It is important to remember overall privacy requirements and to obtain patient's understanding and consent before proceeding.

- Landline telephones are commonly available (more so for the older population) and can be used for assessments, monitoring and tracking progress.
- Furthermore, email is used by so many government and commercial services that the great majority of patients use email, so email can also be used for assessment (surveys), tracking and providing links to online resources.
- Simple text messages can be used to prompt actions, provide information and provide appointment reminders (Chow et al 2015).
- Videoconferencing for instance, provides an opportunity for visual assessments, instruction and, importantly, group-based delivery, so necessary to improve efficiency. Patients will often need advice on how to manage a videoconference well including accessing necessary software/apps, microphone, and camera set-up and protecting the privacy of their home.
- Ideally, a specifically-designed [telehealth platform](#) should be developed for cardiac rehabilitation, which includes remote monitoring complete with Bluetooth linked BP, heart rate and activity trackers (Neubeck et al 2020).

It's vital to remember that face-to-face delivered content needs to be adapted for remote delivery. For each check-in progress and outcomes data should be collected and recorded.

Patients will need advice on exercise equipment they could practically use at home, planning and tracking their exercise. Excellent guidance for developing home-based programs is provided by the [American Heart Association \(2019\)](#).

Finally the [Australian Cardiovascular Health and Rehabilitation Association](#) provides resources for members and operates a discussion group to support members during this time.

## 7. Providing patient self-care management education relevant to COVID-19

Nurses providing cardiovascular care are exceptionally skilled at engaging with the patient and providing patient self-management education and support. Important aspects of self-care management education during the COVID-19 pandemic are:

- Maintaining contact with healthcare and avoid treatment delay, especially in an emergency
- Avoiding infection with COVID-19
- Supporting and strengthening self-care management

### Education to avoid treatment delay

As cardiovascular nurses we recognise that timely treatment for [heart attack and stroke is critical](#). The toll of COVID-19 will be much higher, particularly if individuals face increased disability through not accessing treatments for heart attack and stroke.

Provide reassurance to the patient at every encounter:

- The importance of following health advice and attending all scheduled appointments, pathology tests and medical investigations
- Not to hesitate to call 000 (111 in New Zealand) in an emergency
- That the healthcare system is well placed to deal with chest pain, arrhythmias, heart attacks and strokes (and all other emergencies) at this time and that delaying seeking treatment may have severe and possibly fatal consequences

- That the healthcare system has taken necessary precautions to minimise the risk of infection from COVID-19 and that accessing healthcare is safe

### Education to reduce the risk of infection

It is important to educate all cardiovascular patients, their families and carers about the importance of taking all possible steps to reduce the risk of infection of the patient with COVID-19.

- State and Federal public health [recommendations](#) and advice should be strictly followed by the patient and all individuals who have contact with them
- Adhere to government advice regarding [isolation](#) (social/physical distancing). Avoid every unnecessary contact with other people other than those in your household this is especially important for those deemed to be a greatest risk of COVID-19. For those at greatest risk, it may be necessary to remove in-person contact with anyone other than household members and essential care providers such as healthcare professionals
- Wash hands thoroughly with soap and water for at least 20 seconds and frequently throughout the day, especially after contact with any potential sources of transmission. Soap and water and thorough washing is preferable to alcohol hand gels (which are suitable to use if soap and water are unavailable)
- Be aware of possible symptoms of COVID-19 (for patient and household members) and access testing immediately without delay. Provide clear information to patients and carers as to what symptoms to be aware of and steps to take should symptoms present
- Isolate any household member with possible symptoms (remove contact with the patient with cardiovascular disease) and follow government advice for arranging testing for COVID-19
- Provide clear information to patient's family/carers on managing a cardiac emergency during the pandemic. Underscore the importance of seeking emergency care early and not to delay calling an ambulance. Provide information to patients' carer/family on safe CPR protocols according to the [Australian](#) or [New Zealand Resuscitation Guidelines](#).

### Education to support and strengthen self-care management:

- Follow all advice given by the patients' healthcare team at all times. People with heart disease should continue taking their regular medicines including blood pressure lowering medicines
- Self-care advice for cardiovascular patients during the COVID-19 pandemic is provided by the Heart Foundation [in Australia](#) or [New Zealand](#) and patients can contact the Heart Foundation Help line on 13 11 12 (Australia) 0800 863 375 (New Zealand)
- Organise flu vaccine early and if recommended, pneumococcal vaccine
- Ensure patient has access to adequate supply of regular medications and make arrangements for repeat prescriptions and delivery of medications through home delivery services/family/carers. Underscore importance of adhering to regular medications
- Reassure patients that most GP clinics are offering telehealth consults, especially for prescriptions
- Ensure patient and carers/family are well informed regarding signs and symptoms of deterioration as well as how to self-monitor the patient's condition daily
- Highlight the importance of adhering to a healthy lifestyle including a healthy diet to maintain health, avoid frailty and malnutrition. The Heart Foundation have provided the general [healthy eating suggestion](#) for people with CVD, and research articles have also indicated the importance of [healthy food](#) in maintaining [good health](#).



Home isolation for people with cardiovascular disease will lead many patients to be reliant on family, neighbours and home delivery services for food/meal supply. Assess the patients plan for accessing healthy food and meal preparation and refer early to relevant local social support organisations for meal delivery for vulnerable patients who may be at risk of malnutrition or are identified with inadequate food/meal supply.

- Advise patient to avoid alcohol and seek support if alcohol intake increases
- Encourage smoking cessation for the patient and any household members. [Smoking](#) increases the risk of contracting COVID-19 and leads to worse outcomes for people with COVID-19.

Quitting smoking delivers health benefits in both the short and long-term. Refer the patient to Quitline 13 78 48. [The Cochrane Collaboration](#) has curated a special collection of Cochrane Reviews on effective options for quitting smoking during the COVID-19 pandemic.

- Patients and families will be experiencing great levels of stress during this time. Provide support and information to patients, families and caregivers in regard to the mental health aspects of isolation and physical distancing.

Use your knowledge and expertise to inform, support and reassure. Refer patients and carers/family members to [Beyond Blue](#) (helpline: 1300 22 4636), [LifeLine](#) (helpline: 13 11 44), Mensline (helpline: 1300 78 99 78), and other registered mental healthcare support services.

Individuals who are experiencing emotional distress or mental health concerns can access psychologist care through [Medicare](#), when they have a GP care plan developed.

- Encourage patients to only seek advice from recognised health care professionals (Registered Nurse/Nurse Practitioner, Pharmacist, Cardiologist, GP, Psychologist, Allied Health Professionals) and high quality sources of information online ([Heart Foundation](#) and State and [Federal](#) public health websites, including [Health Direct](#))
- Highlight the importance of calling 000 (111 in New Zealand) in the event of any deterioration of health (including chest pain, worsening heart failure, recurrences of arrhythmias) or cardiac arrest or respiratory distress. Patients may need this emphasised as there may be a hesitation to call due to fears of the exposure to COVID-19 in a hospital setting or not wanting to add to the burden on the healthcare system. Encourage cardiac patients to seek emergency care early and not to delay calling an ambulance. Advise patients/carers to inform the emergency operator if the person is in isolation because of COVID-19. Inform patients and families that the Ambulance personnel responding may be wearing PPE.

The [Australian Centre for Heart Health](#) offers The Cardiac Wellbeing Program™ and has developed a range of online and telephone support programs.

The [European Society of Cardiology](#) (ESC) [Heart Failure Matters](#) online patient education platform is a great support for patient self-management and also covers COVID-19 for heart failure patients and carers and is free to access.

The European Heart Rhythm Association (EHRA) [Afib Matters](#) supports the information provided for patients with atrial fibrillation and their carers.

## 8. End of life care/palliative care/advance care planning

[Cardiovascular disease and COVID-19: Australian/New Zealand consensus statement](#) clearly identifies that people with pre-existing CVD are at increased risk of adverse outcomes and death. COVID-19 highlights the urgent need for people with pre-existing CVD to have crucial end of life [goals of care conversations with their partner and family](#), particularly in regards to the extent of the active treatment

they wish to receive, if clinically indicated (i.e. cardio-pulmonary resuscitation (CPR) and/or invasive or non-invasive ventilation).

Patients and their family may not be aware that hospitals are either restricting or not allowing visitors to hospitals for all patients, not just those hospitalised with COVID-19. The patient's family may not be able to visit the patient in hospital or be with the patient before or after the time of death. This fact may have significant implications for the type of care that patients who are elevated risk of mortality wish to receive and this should be clearly communicated.

Cardiologists and cardiovascular nurses need to know what their patients' wishes are. Conversations about end-of-life care in the context of COVID-19 require identifying what each person's wishes are, to provide patient centred care. Insight MJA discusses [Integrating palliative care into COVID-19 planning](#) and how all clinicians may be required to provide generalist palliative care. There are clear benefits to advance care planning when people choose not to receive active treatment, or want to avoid futile intervention and burdensome or unwanted treatment the [ACP Australia](#) website is an excellent resource. A recent publication (Waldman E & Glass M, 2019) provides excellent insights into providing palliative care during humanitarian crises and is [available open access online](#).

There are a number of helpful resources about initiating and documenting goals of care conversations on the [COVID-19 CareSearch](#) knowledge network hub, which is updated on a daily basis and has targeted information for: [nurses](#); [aged care](#); [hospitals](#); [GPs and Primary Care](#).

Non-specialist palliative care clinicians need to assess their capabilities and access to resources and use educational resources online (eg, [CareSearch](#)) and from their local palliative care service to inform palliative practice. Cardiovascular clinicians will be required to provide generalist palliative care when patients die under their care. Reach out to the local palliative care team if your patient has symptoms that are challenging to manage.

Australia's peak palliative care organisations bodies have formed the Australian COVID-19 Palliative Care Working Group (ACPCWG) due to the likelihood that COVID-19 will cause significant mortality. This partnership is with [Palliative Care Australia](#) (PCA), the [Australian and New Zealand Society of Palliative Medicine](#) (ANZSPM), [Palliative Care Nurses Australia](#) (PCNA), the [Australasian Chapter of Palliative Medicine](#) (AChPM), the [Royal College of Physicians](#) (RACP), [Paediatric Palliative Care Australia and New Zealand](#) (PaPCANZ), [CareSearch](#) and the [End of Life Directions for Aged Care \(ELDAC\) Project](#).

## 9. Self-care for nursing staff

Nurses have a longstanding history and track record in the healthcare response to pandemics and public health crises. Fernandez et al 2020 reviewed nurses' experiences of working in acute hospital settings during pandemics. This review concludes that *"the significant impact of nurses' experiences highlights a need for strategies around self-care and ongoing support to ensure the health of nurses is maintained."*

A clinician-led innovative program [Pandemic Kindness](#) to support clinicians during the pandemic has been launched and provides comprehensive resources and advice.

Key principals of self-care for nursing staff during the pandemic:

- Remember to always use appropriate PPE, your safety and wellbeing is paramount. We must do everything we can to protect our expert healthcare workforce
- Organise flu vaccination for yourself and for your team. Recommendation is for early administration this year to reduce risk of influenza complicating COVID-19 infection

- Report any possible COVID-19 symptoms you may experience early and follow your local health services recommendations regarding testing and isolation
- Discuss risk minimisation and working arrangements with your manager if you are a [healthcare worker](#) at high risk of complications from COVID-19
- Take regular breaks, have a healthy balanced diet and ensure adequate rest (including sleep) and exercise and time outdoors in the sun and fresh air
- Access support that is available in your area (hotel accommodation to isolate from family/partner if preferred, meal preparation and delivery, grocery shopping arrangements) for health care workers
- Support your team and build positive relationships in your workplace
- Seek support to maintain mental health – identify apps, online services, phone services that can provide support. Consider a plan of action early to manage work stress, exhaustion, and anxiety
- Reach out to your colleagues in other hospitals or professional bodies for support and information (see list at the end of this document)
- Ensure emotional and physical health is balanced. There are many free apps or online resources for yoga/mindfulness and exercise

## Summary

The COVID-19 pandemic presents a unique challenge to all of society, and especially the healthcare system and those working in healthcare. The COVID-19 pandemic has and will challenge the way that we provide cardiovascular care in the coming weeks and months. There may be lasting impacts on models of cardiovascular care beyond the pandemic period. We should reflect on the delivery of care using the alternative models to identify aspects of care during the pandemic that have benefits worthy of being carried forward post-pandemic.

Nurses are intelligent, well educated, highly skilled healthcare professionals who provide care across the lifespan, in many different healthcare and community settings. At this extraordinary time we acknowledge that the specialist knowledge, skills and expertise of cardiovascular nurses will be called upon to provide care and leadership in settings outside of our typical patient populations and clinical environments. There is no doubt we will come together to support each other and bring our expertise and skills to the challenges that will be presented to us this year, and to deliver the very best care to all of our patients.

Self-care will be vital to managing this challenge. Cardiovascular nurses are excellent at educating and supporting self-care for our patients, but now, more than ever we must practice our own self-care during these challenging times.

## Key online resources for cardiovascular nursing

**\*\*See resources listed in reference list also**

### **Australian Government resources:**

- Department of Health, Australian Government: COVID-19 infection control training (30-mins online): <https://www.health.gov.au/resources/apps-and-tools/covid-19-infection-control-training>
- Australian Health Practitioner Regular Agency (AHPRA): <https://www.ahpra.gov.au/News/COVID-19.aspx>
- Department of Health: <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-current-situation-and-case-numbers>
- Australian government, COVID-19 information for health and residential aged care workers: <https://www.health.gov.au/resources/publications/coronavirus-covid-19-information-for-health-care-and-residential-care-workers>
- Queensland Health, COVID-19 resources and information for clinicians: <https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/novel-coronavirus-qlc-clinicians/resources-for-clinicians>
- SA health, COVID-19 information for health professionals: <https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/health+topics/s/health+topics+a+-+z/covid+2019/health+professionals>
- NSW Health: <https://www.health.nsw.gov.au/Infectious/diseases/Pages/covid-19-resources.aspx#hands>
- NT government: <https://coronavirus.nt.gov.au>
- WA Health: [https://ww2.health.wa.gov.au/Articles/A\\_E/Coronavirus](https://ww2.health.wa.gov.au/Articles/A_E/Coronavirus)
- VIC Health: <https://www.dhhs.vic.gov.au/health-services-and-general-practitioners-coronavirus-disease-covid-19>
- ACT Health: <https://www.covid19.act.gov.au>
- Adelaide PHN, COVID-19 provider update: <https://adelaidephn.com.au/covid-19-provider-update>
- Australian Cyber Security Centre <https://www.cyber.gov.au/publications/web-conferencing-security>
- Medicare Benefits Schedule <http://www.mbsonline.gov.au/>

### **Australian COVID-19 resources:**

- CSANZ sharing portal: <https://www.csanz.edu.au/covid-19/>
- Cochrane Living Guidelines Caring for people with COVID-19: <https://covid19evidence.net.au/>
- Joanna Briggs Institute, COVID-19 special collection: <https://joannabriggs.org/ebp/covid-19>
- Australia and New Zealand Intensive Care Society COVID-19 Resources for Critical Care Professionals: <https://www.anzics.com.au/coronavirus-resources/>
- The Australasian Society for Infectious Diseases: <https://www.asid.net.au/>
- Palliative Care Australia – Palliative Care and Advanced Care Planning: <https://palliativecare.org.au/covid-19-updates>
- Australian Resuscitation Council <https://resus.org.au/>
- New Zealand Resuscitation Council: <https://www.nzrc.org.nz/conference/>
- NSW Agency for Clinical Innovation COVID-19 telehealth guidance: <https://www.aci.health.nsw.gov.au/make-it-happen/telehealth>

### **Cardiovascular organisations COVID-19 resources:**

- CSANZ sharing portal: <https://www.csanz.edu.au/covid-19/>
- Heart Foundation Australia: <https://www.heartfoundation.org.au>
- Heart Foundation New Zealand: <https://www.heartfoundation.org.nz>

- American College of Cardiology COVID-19 hub: <https://www.acc.org/covid19#sort=%40fcommonsorthdate90022%20descending>
- British Cardiovascular Society- COVID-19 Clinician's Resource Hub: <https://www.britishcardiosocietysociety.org/resources/covid-19-clinicians-hub>
- American Heart Association COVID-19 Content: [https://www.professional.heart.org/professional/General/UCM\\_505868\\_COVID-19-Professional-Resources.jsp](https://www.professional.heart.org/professional/General/UCM_505868_COVID-19-Professional-Resources.jsp)

#### **Evidence summaries**

- Cochrane Living Guidelines Caring for people with COVID-19: <https://covid19evidence.net.au/>
- Cochrane COVID-19 resources and news: <https://www.cochrane.org/coronavirus-covid-19-cochrane-resources-and-news>
- Oxford Centre for Evidence Based Medicine COVID-19 Evidence Service: <https://www.cebm.net/covid-19/>

#### **Videos, training courses and Podcasts**

- Department of Health, Australian Government: COVID-19 infection control training (30-mins online): <https://www.health.gov.au/resources/apps-and-tools/covid-19-infection-control-training>
- SURGE Critical Care Course, sponsored by the Australian Government Department of Health: <https://medcast.com.au/surge-critical-care>
- PPE Demonstration Videos [http://www.dhhs.tas.gov.au/publichealth/tasmanian\\_infection\\_prevention\\_and\\_control\\_unit/health\\_care\\_worker\\_education/proper\\_use\\_of\\_personal\\_protective\\_equipment](http://www.dhhs.tas.gov.au/publichealth/tasmanian_infection_prevention_and_control_unit/health_care_worker_education/proper_use_of_personal_protective_equipment)
- NSW Clinical Excellence Commission <http://www.cec.health.nsw.gov.au/keeping-patients-safe/COVID-19>
- WHO COVID-19 training courses: <https://openwho.org/courses/COVID-19-IPC-EN>
- Australian Nursing and Midwifery Federation Tasmania- Training Course (members only): <https://anmftas.org.au/2020/03/covid-19memberscpd/>
- Johns Hopkins University, School of Nursing, Dean Patricia Davidson podcast on COVID-19: <https://www.podparadise.com/Podcast/1497188562> Or <https://podcasts.apple.com/nz/podcast/johns-hopkins-nursing-magazine/id1169570900>

#### **Cardiovascular rehabilitation:**

- Australian Cardiovascular Health and Rehabilitation Association (ACRA) <https://www.acra.net.au> additional resources available to members
- Exercise advice and videos to support people with cardiovascular disease to keep exercising during isolation: <https://www.healtheuniversity.ca/en/cardiacollege;> <https://www.bhf.org.uk/information-support/heart-matters-magazine/activity/10-minute-workout;> <https://www.bhf.org.uk/information-support/heart-matters-magazine/activity/strength-exercises>
- The Six Minute Walk test: <https://pulmonaryrehab.com.au/patient-assessment/assessing-exercise-capacity/six-minute-walk-test/>

#### **Nursing organisations:**

- Australian Nursing & Midwifery Federation: <http://anmf.org.au/campaign/entry/coronavirus-covid-19-information-for-members>
- Australian College of Nursing COVID-19 resources: <https://www.acn.edu.au/covid-19-resources>
- Australian Critical Care Nurses, COVID-19 resources: <https://www.accn.com.au/professional-development/covid-19-information-and-resources>
- Australian Primary Healthcare Nurses Association: <https://apna.asn.au/hub/news/coronavirusinfoforurses>

- Emergency Nurses Association: <https://www.ena.org/practice-resources/covid-19>
- Cancer Nurses Society of Australia: <https://www.cnsa.org.au/practiceresources/covid-19-resources>
- Palliative Care Nurses Australia: <https://www.pcna.org.au>
- American Nurses Association: <https://www.nursingworld.org/practice-policy/work-environment/health-safety/disaster-preparedness/coronavirus/>

#### **Online or telephone patient support resources**

- Heart Foundation of Australia <https://www.heartfoundation.org.au>
- Heart Foundation New Zealand. <https://www.heartfoundation.org.nz/>
- The Cardiac Wellbeing Program™ The Australian Centre for Heart Health <https://www.australianhearthealth.org.au/cardiac-wellbeing-program>
- European Society of Cardiology: COVID-19 and Cardiology: <https://www.escardio.org/Education/COVID-19-and-Cardiology>
- European Society of Cardiology heart failure patient education and self-management online: [https://www.heartfailurematters.org/en\\_GB/](https://www.heartfailurematters.org/en_GB/)
- European Heart Rhythm Association, AFib Matters: <https://www.afibmatters.org/>

#### **Mental health:**

- Beyond Blue: <https://coronavirus.beyondblue.org.au>
- Lifeline, COVID-19 support: <https://www.lifeline.org.au/get-help/topics/mental-health-and-wellbeing-during-the-coronavirus-covid-19-outbreak>
- Mensline, COVID-19: <https://mensline.org.au/wellbeing-blog/looking-after-your-mental-health-during-covid-19/>
- Head to Health, Department of Health, Australian Government: <https://headtohealth.gov.au/covid-19-support/covid-19>

#### **Smoking:**

- Quit.org FAQs- COVID-19 and smoking : <https://www.quit.org.au/articles/faqs-coronavirus-covid-19-and-smoking/>
- Cochrane, Special Collection: Effective options for quitting smoking during COVID-19: <https://www.cochrane.org/news/special-collection-effective-options-quitting-smoking-during-covid-19>

**Expert contacts:***Remote monitoring and telehealth – heart failure*

Professor Robyn Clark [robyn.clark@flinders.edu.au](mailto:robyn.clark@flinders.edu.au)  
A/Professor Sally Inglis [sally.inglis@uts.edu.au](mailto:sally.inglis@uts.edu.au)  
Professor Andrea Driscoll [andrea.driscoll@deakin.edu.au](mailto:andrea.driscoll@deakin.edu.au)

*Remote monitoring and telehealth – atrial fibrillation*

Professor Jeroen Hendriks [jeroen.hendriks@adelaide.edu.au](mailto:jeroen.hendriks@adelaide.edu.au)

*Alternative models for heart failure management*

Professor Andrea Driscoll [andrea.driscoll@deakin.edu.au](mailto:andrea.driscoll@deakin.edu.au)

*Alternative models of cardiovascular rehabilitation*

Professor Robyn Gallagher [robyn.gallagher@sydney.edu.au](mailto:robyn.gallagher@sydney.edu.au)  
Professor Robyn Clark [robyn.clark@flinders.edu.au](mailto:robyn.clark@flinders.edu.au)

*End of life care and palliative care*

A/Professor Louise Hickman [louise.hickman@uts.edu.au](mailto:louise.hickman@uts.edu.au)

*Interventional nursing*

Carolyn Naismith [carolyn.naismith@austin.org.au](mailto:carolyn.naismith@austin.org.au)  
Kevin White [kevin.white@monashhealth.org](mailto:kevin.white@monashhealth.org)

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