

COVID-19 Guidelines

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Disclaimer: The Australian and New Zealand Intensive Care Society (ANZICS) COVID-19 Guidelines have been developed to assist intensive care clinicians to prepare and plan critical care services in the event of a pandemic, to provide a safe working environment for staff and patients and to give guidance on the identification and treatment of patients with COVID-19 infection. The recommendations have been put together by a team of specialist Intensive Care doctors and nurses, with representative input from the College of Intensive Care Medicine, the Australasian Society for Infectious Diseases, the Australian College of Critical Care Nurses, and the Australian Society of Anaesthetists. The authors have made considerable effort to ensure the information contained within the recommendations is correct at the time of publication. Information provided has been sourced from the best available evidence and expert opinion. Further iterations of these guidelines will be published as new information comes to hand. The Society accepts no responsibility for any inaccuracies, information perceived as misleading, or the success or failure of any of the recommendations detailed in the document. The Australian and New Zealand Intensive Care Society is not liable for the accuracy or completeness of the information in this document. The information in this document cannot replace professional advice.

Welcome to First Nations

The authors acknowledge the First Nations of Australia as the traditional custodians of this land and pay their respects to elders past, present and emerging. The authors acknowledge Māori as tāngata whenua and partners under Te Tiriti o Waitangi in New Zealand.



Foreword

It is with an enormous sense of pride that we present our third version of the ANZICS COVID-19 Guidelines. The guidelines have proved to be an invaluable resource for those critical care health care workers charged with preparing, training and delivering care for patients potentially infected or infected with COVID-19.

Since our second iteration of the guidelines, much has been learnt from the Victorian experience. A recent publication of the ANZICS COVID-19 data suggests our clinical outcomes are extremely gratifying with excellent results. We will continue to be vigilant, learn and research in order to provide the highest standard of care to Australians and New Zealanders as this pandemic evolves. Evidence based best practice guidelines remain a critical component in the armamentarium against this world changing pandemic. These guidelines represent many dedicated hours of work by the ANZICS COVID-19 Working Group and are presented in a concise and easily accessible format. We are indebted to these talented clinicians for their remarkable contribution.

The third edition provides valuable information with respect to Health Care Worker protection and the effective and appropriate use of personal protective equipment (PPE) based on the best available evidence in an incredibly dynamic environment. An especially useful addition to the guidelines is the “risk matrix” providing a grade for the level of pandemic response which is colour coded from green to red indicating an escalation in severity. We are delighted to have an expanded and updated section on Allied Health issues, which I have little doubt will be of use to all clinicians. There are also additions to the section considering engineering, ventilation concerns and future ICU design. The experience gleaned to date revealed the need for guidance surrounding the whole of health systems approach and consideration of the role of the paediatric ICU. One of the very great challenges and tragedies of caring for COVID-19 patients has been the restrictions placed on loved ones. These guidelines provide useful strategies for family engagement and visiting.

The ANZICS Guidelines have never intended to be proscriptive, but rather a valuable resource to be integrated with local recommendations. We can be incredibly proud of the collaborative and pragmatic stance our Society has embraced, in order to deliver meaningful guidance to the critical care community. It is my sincere belief that these guidelines will decrease both morbidity and mortality. We in ANZICS will continue to strive to deliver the best possible tools to support critical care in our fight to defeat COVID-19. We acknowledge with gratitude, the efforts of all and trust that you can safely fulfil your privileged duty to care for patients in challenging times. Thank you to our critical care family.

Anthony Holley
President, ANZICS



Summary of main changes in Version 3

The following additions have been included in Version 3 of the ANZICS COVID-19 Guidelines:

1. Addition of a “risk matrix” table to grade the level of pandemic response from green to red, in escalating severity.
2. An increased emphasis on staffing considerations, in addition to physical ICU capacity, in determining operational responses.
3. The Allied Health section is updated and expanded.
4. New sections contribute to a ‘whole of health’ system approach, including paediatric ICU, family engagement and future ICU design.
5. An expanded section on hospital engineering and ventilation considerations.

Introduction

The COVID-19 viral pandemic represents an unprecedented challenge to intensive care services around the world. In Australia and New Zealand, we are fortunate to have world-class intensive care services, with a highly trained and professional workforce who are ready and able to serve their communities at this time. This document aims to provide a series of recommendations and suggestions to ensure continued high-quality clinical care in the setting of a pandemic. To develop this guideline, we have drawn on the increasing evidence from around the world on how to treat patients with COVID-19 and learnings from the current pandemic experience as well as the contemporary infection control literature for Intensive Care. This is the third version of the ANZICS COVID-19 guideline. The most up to date document and all previous iterations will be found on the ANZICS website www.anzics.com.au.

The situation in Australian and New Zealand remains fluid with Victoria suffering a substantial second wave of COVID-19 infections with the concurrent implementation of significant public health measures. The recurrence of COVID-19 cases in Victoria and to a lesser degree in New South Wales and New Zealand, have demonstrated the need to prepare our hospitals, intensive care units and staff for further surges in COVID-19 cases. The ANZICS community strongly supports all robust public health measures aiming to reduce community transmission, hence 'flattening the pandemic curve' to prevent intensive care services becoming overwhelmed. This is supported by high-quality evidence and is essential to minimise load on limited ICU capacity for all patients, not just those with COVID-19; and to maintain the health, wellbeing, and sustainability of the intensive care workforce. In 2020, the outcomes for critically ill COVID-19 patients in Australian and New Zealand has been amongst the best in the world. This is due to a number of factors, in particular that our health services have not been overwhelmed and that intensive care units have been able to provide high quality critical care.

This document was originally arranged in three parts to provide guidance to critical care clinicians. The following sections remain:

1 Planning for a Pandemic - An Operational Guide **Page 10**

2 Providing a Safe Working Environment - Staff Protection and Sustainability **Page 21**

3 The Identification and Treatment of COVID-19 is now found at covid19evidence.net.au

This section has been removed since Version 2, in light of ANZICS partnering with the National COVID-19 clinical evidence taskforce. This taskforce has brought together the peak health professional bodies across Australia to undertake continuous evidence surveillance to identify and rapidly synthesise emerging research in order to provide national, evidence-based guidelines for the clinical care of people with COVID-19. These are living guidelines that will be updated with new research in real-time in order to give reliable, up to the minute advice to clinicians providing frontline care, including critical care physicians.

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1

Planning for a COVID-19 Pandemic

An Operational Guide for Intensive Care Units in Australia and New Zealand

The doctors, nurses, allied health professionals and researchers who comprise the Australia and New Zealand Intensive Care Society (ANZICS) continue to help the Australian and New Zealand communities during the COVID-19 pandemic. Our members provide high quality, compassionate and professional care to the most vulnerable members of our communities every day and this commitment will not change.

ANZICS strongly supports State, National and International efforts to reduce the spread of pandemic illness through effective public health measures (i.e. social distancing). This approach is supported by high-quality evidence and significantly mitigates the impact on Intensive Care Unit (ICU) capacity, which is a finite resource. Such preventive measures continue to have the greatest positive impact on the health and well-being of our communities.

As seen in previous disasters, the COVID-19 pandemic will further expose pre-existing inequities in chronic health outcomes and health service delivery. We recognise that the Aboriginal and Torres Strait Islanders of Australia and the Māori of Aotearoa New Zealand are over-represented in disadvantaged populations in ways that make them far more vulnerable to pandemic disease. Indigenous communities in Australia and New Zealand have been disproportionately impacted by previous pandemics. We advocate for the best possible access to and provision of critical care support for these groups.

The most important resource in Australian and New Zealand ICUs is experienced Intensive Care staff, who are trained to provide high-quality care for critically ill patients. The delivery of this service must be supported by government policy and community behaviour.

Considerations in ICU Pandemic Planning

It is **essential** that local and jurisdictional ICU pandemic plans be developed, resourced and implemented where appropriate by all healthcare organisations and that all plans should align with health department requirements. Pandemic plans should include operational approaches to reduce routine ICU demand, identify and increase physical ICU bed space capacity throughout the hospital, and determine associated equipment and workforce requirements.

We **recommend** ICU operational status be monitored and reported in an expeditious manner to facilitate the decision making process, minimise system strain and maintain the standards of care required to achieve optimal patient outcomes. Effective information sharing to ensure delivery of the right information to the appropriate persons in a timely manner, is central to an effective pandemic response (see Whole of Health Systems Approach).

We **recommend** that ICU operational status be described in terms of both staffing and physical capacity, in recognition that a match between appropriate staffing and adequate infrastructure is central to the delivery of effective critical care services. This is demonstrated in Table 1 with a corresponding tiered, colour coded description of the current status.

We **recommend** that all efforts should be made to ensure critically ill patients are cared for in ICUs with adequate staffing and equipment resources and minimal compromise to usual models of care. A whole of health system approach involving both jurisdictional authorities and ICUs is absolutely necessary. Partnerships, such as between private and public hospitals, adult and paediatric ICUs, and through telehealth arrangements to support different level ICUs, should be considered to ensure just and equitable delivery of care for all critically ill patients. This ensures the best clinical care and outcomes for critically ill patients.

We **recommend** that healthcare jurisdictions develop a phased response based on the impact of the pandemic on the operational status of the ICU. Demand for ICU capacity due to COVID-19 infection is likely to fluctuate across the duration of the pandemic and local authorities should develop triggers for escalation and de-escalation of their response. ICUs in Australia and New Zealand should aim to continue to operate with usual models of care (within the “green zone” in Table 1) as far as possible.

Table 1. Operational Status Matrix

Escalating phases of the pandemic response are graded from green to red.

		ICU staffing			
		Clinical needs met by regular ICU staffing models	Clinical needs met by redeployment of non-ICU but critical-care trained staff (e.g. ED, Anaesthetics)	Clinical needs met by deployment of non-ICU, non-critical care trained staff	Unable to meet ICU staffing needs
ICU Physical Capacity	ICU retains capacity to meet demand for critical care and ventilation as per usual operations.	Green	Yellow	Orange	Red
	ICU approaching or at capacity to meet demand for all critical care and ventilated patients.	Yellow	Yellow	Orange	Red
	ICU unable to meet overall demand for critical care patients, and at maximum capacity for ventilated patients.	Orange	Orange	Orange	Red
	ICU is significantly beyond capacity for critical care and ventilated patients.	Red	Red	Red	Red

Whole of Health Systems Approach

A whole of health system approach requires mechanisms to have a broad overarching view of current demand as well as projected demand. As a key determinant of capacity, and to improve access to ICU care for patients, visibility of immediate workforce availability is crucial.

We **recommend** the development of a framework to determine risk in order to support planning and the appropriate use of available resources. The components of this framework should include information on local prevalence, the epidemiology of clusters, rate of new COVID-19 cases and the level of control measures in the community. Current Australian experience suggests that approximately 1% of identified community cases are admitted to ICU. Determination of risk can contribute to guidance on the use of PPE as well as the level of elective surgery performed.

Communication and Information Dissemination

Communication within a pandemic is crucial to the successful delivery of safe and effective clinical services. The ever increasing volume of information and literature, research trial engagement and data, evolving guidelines, policies and procedures requires management and streamlining. Priority areas in information dissemination include daily situation reports at a local, regional and state level.

We **recommend**:

- Establishing effective lines of communication to ensure that stakeholders are informed of evolving clinical scenarios and changes in clinical practice guidelines and processes.
- Contributing data to the Critical Health Resource Information System (CHRIS). This is a bi-national dashboard providing real-time data on ICU bed, equipment and staff capacity across Australia and New Zealand. This knowledge assists in minimising delays in patients moving through care.
- The local development of tools for the timely measurement and dissemination of ICU load and capacity. These should facilitate decision making and support for the system-wide allocation of resources and the distribution of patient load.
- Ensuring adequate staffing to support timely data submission to ANZICS CORE and support of research activities. Data is essential to assist planning, review treatments and for the provision of excellent clinical care.

Measures to Reduce ICU Demand

The following measures should be considered to reduce the demand for critical care services and should be enacted before demand exceeds capacity.

Access to COVID-19 Testing

A substantial proportion of patients admitted to ICU will require testing for COVID-19 infection, particularly during periods of widespread community transmission, and subsequent clearance through polymerase chain reaction (PCR) testing. A delay in test results increases the demand on ICU resources, including staffing and the use of personal protective equipment (PPE).

ANZICS **recommends** the establishment of processes which prioritise and expedite the return of COVID-19 results for patients in ICU and other critical care areas such as the emergency department and operating theatres.

Deferment or Cancellation of Non-Urgent Elective Surgery

The decision to defer or cancel elective surgery will depend upon the impact of the pandemic on the operational status of the ICU.

When the pandemic is anticipated to threaten or overwhelm existing capacity (moving from green to yellow), we **recommend** that planning to defer elective surgery take place. This should involve ICU, surgery, anaesthesia and nursing services. These plans will vary between sites.

More advanced stages of the pandemic (amber and red phases) will require cancellation of all elective surgical cases (including minor elective and day surgery). This will allow for staff redeployment, improved patient flow and conservation of PPE.

ICU Discharge Facilitation

We **recommend** implementing safe processes to expedite patient discharge from ICU during phases of increased demand. These may include additional support for ward staff to manage patients of higher acuity, or improving flow in discharging patients to areas with greater clinical oversight (e.g. neurosurgical HDUs).

We **recommend** that ICU specific protocols for the de-escalation of COVID-19 isolation measures be developed in consultation with infection control and infectious disease departments and with consideration of relevant guidelines (e.g. the Communicable Disease Network Australia).

Reserving ICU Admission for Patients Requiring ICU-Specific Interventions

In more advanced stages of the pandemic (amber and red phases in table 1), ICU admission should be prioritised for those who require specific ICU interventions such as mechanical ventilation and organ support. This may necessitate the following:

- Extended stays in the theatre recovery
- Admission to areas capable of HDU level monitoring (e.g. CCU)
- Additional support/supervision for ward staff to manage patients of higher acuity

Proactive Consideration of Treatment Goals

There should be early consideration of treatment goals to avoid ICU/HDU referrals or admissions in patients who are more appropriately managed on the ward. This may be facilitated by ensuring that all patients have documented goals-of-care or equivalent completed upon hospital admission.

Measures to Increase ICU Capacity (Infrastructure)

We **recommend** regular meetings of ICU heads of departments within jurisdictions to address issues relating to significant differences in demand between ICUs. We recommend the use of local and national dashboards (e.g. the CHRIS dashboard) to help guide decision making.

The movement of patients between units may be required to ensure an equitable distribution of patient numbers and workload. The logistics of staff redeployment to areas of need should be explored early.

ANZICS **recommends** that it is preferred to transfer a patient to an ICU with capacity rather than care for a patient in an ICU that has strained staffing or equipment resources.

In addition, we **recommend** all clinical areas with the physical infrastructure suitable to care for critically ill patients should be identified as part of hospital preparedness plans. These include (but are not limited to):

- Complex Care Units or other High Dependency Units
- Perioperative monitoring/recovery areas
- Coronary care units
- Uncommissioned or unstaffed ICU bays
- Decommissioned critical care areas (e.g. 'old' ICUs)

The following criteria are the College of Intensive Care Medicine (CICM) requirements for a high dependency area and may be considered in repurposing an area for the care of critically ill patients:

- Two oxygen outlets
- One air outlet
- Two suction outlets
- Twelve mains electricity outlets
- Appropriate physiological monitoring

Hospitals should work with ICUs to develop processes enabling the repurposing of these areas when needed and in establishing workforce models that allow appropriate critical care staffing across multiple locations. The ability to meet the above standards may be limited in the advanced phases of a pandemic, necessitating adjustments based on the clinical needs of the patients and available resources.

Equipment

We **recommend** ICUs should quantify their current stock of equipment (e.g. ventilators, renal replacement therapy, intravenous infusion pumps) including consumables and disposables and assess potential requirements with increasing ICU load. ICUs should also identify available channels for the supply, storage, and procurement of additional equipment.

This may include:

- Equipment from operating theatres / perioperative environments
- Older but functional equipment not presently in use (e.g. old ventilators which can be operationalised by biomedical departments)
- Manufacturers and suppliers
- Hospital, state or national emergency stockpiles
- Jurisdictional procurement agencies

Table 2. Potential Strategies and Examples for a Phased, Tiered ICU Pandemic Plan

Phase	Impact on ICU	Strategies to consider
1	Minimal impact on daily operations.	<p>Review and test pandemic response plans, including:</p> <ol style="list-style-type: none"> 1. Infrastructure and equipment. 2. Workforce training, planning and support, including the capacity/framework to move staff between sites. 3. Communication plans. 4. Infection control policies and procedures. 5. COVID-19 procedures, diagnostics and treatment protocols. 6. Transport and transfer policies.
2	Moderate impact on daily operations, but still able to meet demand for critical care services.	<ol style="list-style-type: none"> 1. Implementation of measures to reduce demand and increase physical capacity. 2. Ensure regular (daily) discussion between tertiary, metro and regional ICUs to assess clinical strain and resource availability. 3. Transfer of patients (load rebalancing) between ICUs to ensure all patients have access to appropriately staffed and resourced intensive care units. 4. Repurpose alternative clinical areas for non-ventilated critical care patients. 5. Defer or divert non-emergent surgery to private hospitals or other services. 6. Address workforce and staffing needs. 7. Review ICU involvement in non-ICU services (e.g. RRT response, TPN service).
3	Severe impact on daily operations, with ICU unable to meet overall demand for critical care	<ol style="list-style-type: none"> 1. Repurpose alternate clinical areas for ventilated patients. 2. Reassess requirements and thresholds for ICU admission and discharge. 3. Explore options for building additional ICU infrastructure e.g. field hospitals.
4	Overwhelming impact on daily operations, with demand for critical care services significantly exceeding organisation-wide capacity	<ol style="list-style-type: none"> 1. Deliver care of critically ill patients in areas without pre-existing critical care infrastructure. 2. Ongoing liaison with hospital and state health services to operationalise additional ICU infrastructure e.g. field hospitals.

Measures to Increase ICU Capacity (Workforce and Staffing)

It is likely that staff shortages will arise when there is widespread community transmission of COVID-19 infection. The high incidence of healthcare worker infection and the requirement for isolation of close contacts means that a significant proportion of ICU staff may be absent from the workplace during advanced stages of the pandemic.

Due to these potential workforce shortages, non-critical care trained medical, nursing and allied health staff may have to assist in the care of intensive care patients. This should occur with the relevant managerial authorisations, and under the supervision of critical care trained staff, utilising a team-based model of care.

ICUs and hospitals should prioritise meeting the minimum standards for staffing as per the College of Intensive Care Medicine guidelines. However, available resources may change depending on the demand placed upon a health service.

We **recommend** workforce planning should include consideration for pandemic specific requirements, such as additional workload from donning and doffing of personal protective equipment (PPE), the need for additional rest days, and the need to allocate staff to key non-clinical duties such as enforcing infection control procedures.

We **recommend** the use of all available resources to optimise workforce capacity, by identifying and potentially redeploying nursing, medical, allied health and other staff (see below).

We **recommend** that core ICU staff maintain operational readiness through ongoing education, simulation and revision of COVID-19 protocols during periods of low community viral transmission.

Nursing

We **recommend** that nursing staff capable of caring for critically ill patients be identified.

This includes:

- Nursing staff with formal critical care training or experience, but not currently working in ICU (e.g. redeployed, in administrative or non-clinical roles, recently left workforce)
- Paediatric ICU nursing staff
- Nursing staff with experience of critically ill patients in other areas of the hospital (e.g. coronary care nurses)
- Nursing staff in departments with reduced clinical activity who are familiar with a critical care environment (e.g. anaesthetic nurses).

We **recommend** a formal rapid orientation and training program is provided, and these nurses should work under the supervision of an experienced ICU nurse.

We **recommend** that all current casual or part-time ICU nursing staff be encouraged to increase hours and that examination of roster patterns occur to maximise workforce availability whilst maintaining staff well-being.

We **recommend** that changes to models of care be explored with increased ancillary and allied health staff to support ICU nurses (e.g. pharmacists assisting with checking and drawing up of medications).

We **recommend**, in addition, nurses without critical care experience may be suitably trained and redeployed to assist with the following:

- Supervision of staff and visitors donning/doffing of PPE
- Routine nursing care - turning, washing
- Re-supply, storage and inventory of equipment
- Medication delivery and checking
- Documentation
- Maintaining bed management and patient flow information
- Supporting essential pandemic research projects.

Medical

We **recommend** additional medical staffing for the ICU should be sourced by considering:

- Senior medical staff with critical care training, but not currently working in ICU
- Paediatric ICU medical staff
- Anaesthetic staff (expected reduction in surgical activity)
- Junior medical staff with critical care experience
- Career medical officers with critical care experience.

We **recommend** medical staff should be deployed in a manner that is aligned with their current scope of practice.

- Anaesthetic staff may be deployed as hospital 'resuscitators', making up intubation teams, to lead rapid response teams or to assist in intensive care ideally under the supervision of intensive care specialists.
- Medical staff with critical care training may be deployed to manage HDU patients in repurposed clinical areas physically separate from the ICU, under the supervision of more experienced ICU staff.
- Junior medical staff with little to no ICU training may assist with documentation and non-ICU clinical activities.

Where medical staff are requested to perform duties outside their usual scope of practice due to severe workforce shortages (e.g. anaesthetists taking on an intensivist role), this should be at their discretion and with jurisdictional reassurance regarding indemnity coverage as well as adequate supervision.

Additional Considerations

To ensure a sustainable workforce, we **recommend** the following:

- Streamlining of administrative processes (e.g. electronic health record training and healthcare practitioner credentialing) that may otherwise limit staffing flexibility and delay onboarding of new staff members.
- Accommodation for staff who are unable to return home e.g. because of vulnerable family members.
- Debriefing and psychological support; staff morale may be adversely affected due to the increased workload, anxiety over personal safety and the health of family members.
- The cancellation of pre-arranged annual leave during a pandemic should only be considered if absolutely necessary.

Allied Health

Physiotherapy

Physiotherapy may be beneficial in the respiratory and physical rehabilitation of patients with COVID-19 in ICU. Clinical practice recommendations for COVID-19 and minimum standards for ICU physiotherapists have been published. Under surge conditions, we **recommend** that physiotherapists with critical care experience be identified by hospitals and facilitated to return to ICU.

Patients with COVID-19 may be at risk of developing post-ICU impairments, including ICU acquired weakness (ICU-AW). These risks are due to intensive medical management, including prolonged protective lung ventilation, sedation, use of steroids and neuromuscular blocking agents and other environmental factors. ICU-AW has independently been associated with increased morbidity and mortality.

The risks of COVID-19 transmission from physiotherapy interventions should be weighed against the benefits of the treatment being undertaken. We **recommend** the involvement of senior physiotherapists and medical staff in these decisions.

We **recommend** that physiotherapists provide extended support to the critical care team in the following areas:

- Involvement in proning teams.
- Supporting any possible nursing workforce shortages where skills may overlap or require minimal additional training for critical care physiotherapists (e.g. respiratory care, ventilation management).
- Serving as a conduit between ICU and the ward e.g. advising and supporting ward colleagues with the physical rehabilitation in COVID-19 patients post-ICU.
- Reducing post-ICU disability through referral to existing programs such as pulmonary rehabilitation, or specialised ICU follow-up clinics or support groups.
- Developing local pathways for the identification and management of Post Intensive Care Syndrome.

Pharmacy

The clinical responsibilities of ICU pharmacists include support of drug safety and prescribing, the reconciliation of patient admission medications and the procurement of important pharmaceuticals for patient management. These activities can be challenging during a pandemic, with the potential for medication shortages, changes to drug administration practices and rapidly evolving evidence.

We **recommend** that pharmacists with critical care experience be identified to manage any potential ICU pharmacy service shortfall (due to increased workplace demand or ill/quarantined staff).

The education, upskilling and support of these pharmacists is essential to assist the core ICU pharmacy service, with the aim of maintaining the recommended one pharmacist per ICU team/pod.

Social Work

Social workers provide psychosocial care for patients and their support network during ICU admission. Under surge conditions, we **recommend** social workers with critical care experience be made available to the intensive care unit with a focus on:

- Bereavement and grief support, including psychological first aid.
- End of life care and planning.
- Risk assessments for vulnerable patients (and those they care for).
- Determining the medical decision maker, particularly in situations of conflict.
- Facilitating communication between health teams, patients and their loved ones, particularly during periods of restricted visitation.
- Navigating the social care system including newly formed pandemic services.

Dietetics

Dietitians provide expertise in nutrition management for critically ill patients, many of whom may have complex clinical conditions.

The long-term impact of a prolonged ICU stay due to COVID-19 infection on nutritional adequacy is unknown. Dietitians have an important role in the management of these patients.

During periods of significantly increased demand, we **recommend** that critical care specialised dietitians look after the sickest patients, triage workload and provide clinical supervision to staff. During surge conditions, non critical care dietitians may need to be redeployed to ICU, under the supervision of an experienced clinician. This may include the use of nutrition assistants to support clinical dietitians.

Existing models of care may need to be extended to overcome food service delivery for patients in isolation.

Speech Pathology

Speech Pathologists provide expertise in the diagnosis, management and rehabilitation of swallowing functions, for ventilated and non-ventilated patients.

Patients may have diverse communication needs during a pandemic, particularly during periods of limited family visitation and isolation. We **recommend** that speech pathologists be engaged early to enhance and promote effective patient communication with staff and family - this can include augmentative and alternative communication systems.

The commencement of early rehabilitation may reduce the risk of protracted dysphagia and communication disorders. Specific techniques should be employed to minimise the risk of aerosol generation.

Family Engagement and Visitation

Due to the highly transmissible nature of this disease, strict ICU visitation controls may be necessary. It is recognised that this can contribute to complicated grief for members of the public and moral distress for healthcare workers.

ANZICS endorses the Australian College of Critical Care Nurses (ACCCN) position statement on facilitating next-of-kin visitation.

Family visitation may be considered appropriate in certain circumstances, for example during end of life care. This should be in alignment with jurisdictional recommendations. The safety of visitors is paramount and healthcare staff may need to provide relatives with training in the use of personal protective equipment during ICU visitation. Visitors should be deemed fit and well, not self-isolating due to COVID-19 exposure, and not currently COVID-19 positive.

We **recommend**:

- ICUs explore and implement methods of communication that allow for patient and clinician interaction with family members, and establish appropriate governance and best-practice guidelines.
- Equipment/technology with secure platforms be made available for video conferencing between patient, family and medical staff.
- A communication plan is established with families shortly after ICU arrival, offering different communication platforms and identifying and mitigating any potential barriers to communication and engagement.
- Structured and predictable communication with families occurs at least daily. This should incorporate both contact between family and the patient, and family and the healthcare team, such as in a scheduled phone or video call.
- Families are encouraged to maintain contact with patients through other means, such as web-based remote family conferences, diaries, drawings and text messages.
- Consideration be given to how the explanation of restrictive visitation policies is delivered (standardised communication, leaflet, public-facing website).
- Mechanisms exist for the delivery of essential items to the patient such as glasses, dentures, phone chargers etc.

Pandemic Planning in Remote, Rural and Regional Areas

ANZICS strongly **advocates** for geographical equity. Patients living in remote, rural or regional areas of Australia or New Zealand should not be disadvantaged during the COVID-19 pandemic. The different levels of critical care provision in these areas are described in the supplementary appendix 1.

Remote, rural and regional health services will face significant challenges in the protracted pandemic response to COVID-19. These include the availability of sufficient resources, in particular equipment and workforce, and timely support for the management of critically ill patients.

We **advocate** for a centralised process to mobilise critical care trained staff to areas of need during the crisis phase of the pandemic.

Anticipated workforce shortages should be identified early and addressed in a proactive manner. Clear lines of communication for support and escalation should be established. This response should occur within and between health services and jurisdictions.

We **recommend** that workforce expansion take place as per **ANZICS Planning for a COVID-19 Pandemic Guideline**, and that remote, rural and regional areas also:

- Plan for staff shortages, and do not rely on short-term fly-in-fly-out (FIFO) services, or the arrival of clinicians who hold fractional appointments across multiple facilities.
- Identify staff with critical care and airway skills to provide 24/7 cover of designated critical care areas.
- Expand the use of telehealth and virtual care services to provide additional support to doctors, nurses and allied health professionals.
- Explore on-call provision from alternative sites to support local intensivists who may have a greater on-call burden from having a more inexperienced junior medical staff pool.
- Identify, facilitate and provide practical support for locum doctors and agency nurses who wish to remain at a regional/rural health centre for a longer period.
- Implement reasonable infection control precautions when FIFOs and rotating doctors/ nurses move from “hot zones” where community or hospital transmission has been identified, into “cold zones” where this has not yet occurred.
- Allow for increased research and data collection support to give patients access to clinical trials and manage reporting requirements for the increased patient load.

In facilitating the care of critically ill patients in remote, rural and regional health services, we **recommend**:

- An emphasis on early, proactive community and hospital-based goals of care discussions, as these may influence decisions to treat locally or seek critical care retrieval.
- Establishing clear lines of communication for clinicians seeking advice or retrieval.
- Timely interhospital transfer for emergency interventions.
- Hospitals support data collection and reporting of daily COVID-19 ICU caseload into the relevant critical care and pandemic surveillance systems.

In planning to expand health service capacity, we **recommend**:

- Hospitals nominate a local inter-professional COVID-19 critical care leadership group with authority for pandemic critical care portfolios and their delegation.
- Resident intensivists in regional ICUs allocate time to proactively assist local acute wards and smaller hospitals in their planning and training for pandemic critical care.
- Hospitals take a regular inventory of ventilators, ICU equipment, medications, PPE, available clinical areas, and diagnostic services (including COVID-19 testing).

We **recommend** that small rural hospitals provide invasive ventilation:

- In accordance with the principles of the ANZICS COVID-19 guidelines.
- With local and remotely supported education for rapid workforce upskilling.

In health services unable to provide invasive ventilation, we **recommend** that:

- Hospitals make plans to provide HFNO and NIV in accordance with ANZICS COVID-19 guidelines.
- Early retrieval takes place of appropriate critical care patients from facilities unable to provide short term respiratory support.
- Local staff are assisted in the management of patients who are not likely to benefit from retrieval to an ICU.

Pandemic Planning in Paediatric ICUs

COVID-19 is an uncommon cause of severe or critical illness in children. Most children with COVID-19 are asymptomatic or have only mild respiratory signs. Between 2 and 20% of hospitalised children with COVID-19 infection need ICU admission.

Children with chronic underlying diseases are susceptible to serious complications of COVID-19 infection. Paediatric patients with cerebral palsy, chronic lung disease, congenital heart disease, type 1 diabetes, immune problems and cancer, are more likely to be hospitalised and are at higher risk of dying than the general paediatric population. Adolescents with obesity or hypertension are also at an increased risk of complications.

We **recommend** that the identification and management of COVID-19 infection in paediatric patients is in accordance with the National COVID-19 clinical evidence taskforce <https://covid19evidence.net.au/>.

Children appear to be less likely than adult patients to transmit COVID-19 infection.

We **recommend**:

- The same principles of infection control and staff safety as for adult ICU patients (see **ANZICS guideline Section 2: Staff Safety**).
- Having a low threshold for the testing of paediatric patients on ICU admission to ensure early clearance from COVID-19 precautions and subsequent staff reassurance. In periods of high community transmission, it may be appropriate to test all paediatric ICU admissions.
- That visitors be restricted to one family member during periods of significant community transmission (see **ANZICS guideline Section 1: Family Engagement**).

Social distancing and mask wearing may reduce the incidence of paediatric ICU admissions with seasonal respiratory illness. Additionally, the deferment of non-urgent elective surgery during periods of widespread COVID-19 transmission may increase PICU bed capacity. It is possible that PICUs may be used to manage adult COVID-19 ICU patients during periods of increased demand.

Clinical manifestations of COVID-19 infection in children may differ from adults. In addition to the more commonly seen manifestations such as pneumonitis, COVID-19 infection may lead to a generalised viral illness, with high fever ($T > 39$ C), erythematous rash, diarrhoea and vomiting.

Rarely, COVID-19 in children is associated with a delayed hyper-inflammatory syndrome called Paediatric Multisystem Inflammatory Syndrome (PIMS-TS). This can appear similar to Kawasaki disease and toxic shock syndrome and may occur during an acute COVID-19 pneumonitis or 2-4 weeks afterwards.

Rapid Response, Medical Emergency and Code Blue Teams

ANZICS **supports** the recommendations of the International Society for Rapid Response Systems. Modifications to rapid response team (RRT) models of care should align with these guidelines whilst being individualised to the needs and resources of each jurisdiction.

In order to minimise the risk of healthcare staff infection, we **recommend**:

- Health services review Rapid Response Team (RRT) models of care for ward patients with COVID-19 infection, with consideration given towards the need for enhanced infection control measures.
- All RRT members receive training in donning and doffing of PPE, and that PPE for airborne precautions is readily available to RRT members for relevant patient interactions.
- During a MET call or code blue, entry to a patient's room should be limited to vital members of staff.
- A therapeutic escalation plan be developed for patients with COVID-19, with particular consideration to appropriate infection control measures for various forms of aerosol-generating procedures.
- Where possible, wards should identify appropriate locations for delivery of high-flow nasal oxygen, non-invasive ventilation, and endotracheal intubation.
- If aerosol-generating procedures (AGP) are required, these should ideally be performed in a negative pressure room, however, this needs to be balanced with the safety of transporting the patient.
- That a PPE spotter be used if available. This may reduce the risk to staff of accidental exposure.

In order to reduce the demands on ICU staff and facilitate optimal patient management and disposition, we **recommend**:

- All patients have their goals of care clarified on hospital admission, and that this be communicated clearly to the RRT members on arrival.
- If staffing permits, the ICU will maintain a senior decision-maker for the assessment of patients outside the ICU.
- Alternative non-ICU based MET team staffing models should be considered in advanced phases of the pandemic.
- RRT staffing models by non-ICU staff may be utilised, but must include appropriate training of members.
- Clinical criteria for MET team activation in COVID-19 patients should pay particular attention to escalating oxygen requirements and respiratory rate, both of which have been associated with adverse outcomes.
- Hospitals identify COVID-19 patients at risk of clinical deterioration and develop a strategy for information sharing with critical care services. This will enhance the clinical visibility of the ward burden of COVID-19 patients and anticipated admissions to ICU. This may also include unique RRT alerts for COVID-19 patients to enhance staff preparedness.



Patient Transport

In principle, the movement of patients with COVID-19 should be limited with all efforts made to ensure the patient is initially admitted to the appropriate location.

The risk and benefit of a proposed inter-hospital transport of a COVID-19 suspected patient must be considered, with staff safety an important concern. All involved agencies (e.g. aeromedical retrieval services), as well as the accepting ICU, should be made aware of the potential/proven infection.

We **recommend** the following for patient transport:

- All staff undertake airborne precautions with the use of appropriate PPE at all times.
- Once a patient is admitted to the ICU, transport outside of the ICU should be limited. If transport is required, then coordination at a senior level is mandatory to ensure safety standards are maintained.
- Hallways must be cleared where possible and only essential staff should accompany the patient. Staff not involved in the transfer should not come within 2 metres of the patient.
- Intubated patients should have closed ventilator circuits with a viral filter in situ.

In patients requiring intrahospital transport from the ED to the ICU we **recommend**:

- That the shortest and safest transport route be identified.
- Clear agreement on which speciality/team will be responsible for the intrahospital transport of critically ill patients from ED to ICU.
- That ED staff involved in any prolonged or resuscitative care should ideally not transfer the patient. If they do so they should don fresh PPE.

Facilitating Emergency Department Management

ANZICS **recommends** that ICUs co-ordinate with Emergency Departments to support the management and disposition of critically ill patients during periods of high COVID-19 patient load.

Inter-departmental plans should include the early referral to ICU of patients (both COVID-19 and non-COVID-19) requiring physiological support as a means to optimise patient flow and improve emergency department capacity.

We support the Australian College of Emergency Medicine COVID-19 guidelines and **recommend** they be considered in the development of local policies.

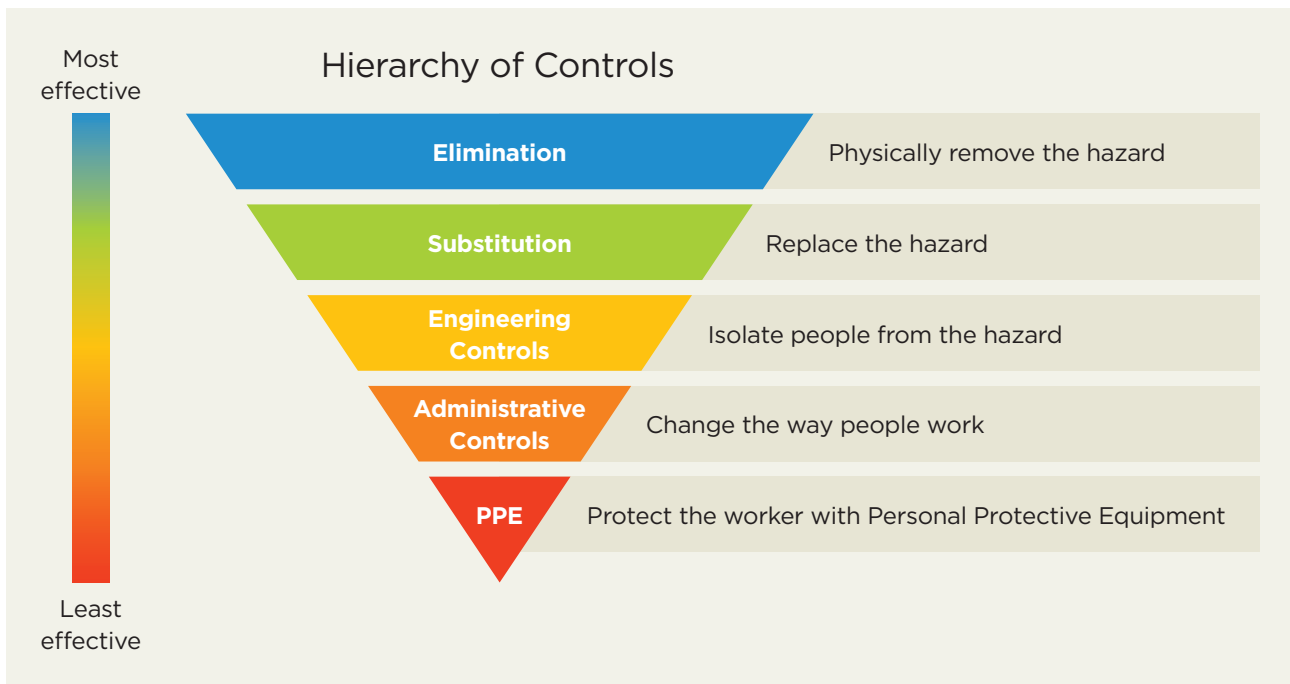
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Providing a Safe Working Environment Staff Protection and Sustainability

General Principles of Infection Control

Controlling exposure to COVID-19 is the fundamental method of protecting health care workers.

This can be represented by a hierarchy of controls. Engineering controls are designed to remove the hazard at the source before it comes in contact with the worker. Administrative controls and Personal Protection Equipment (PPE) are frequently used with existing processes where hazards are not particularly well controlled. Safety of staff is paramount to protect the individual health care worker and to ensure a viable workforce for the duration of the pandemic.



In Australia, the national infection control standards are the national standard AS/NZS 1715: 2009 and National Health and Medical Research Council, Australian Guidelines for the Prevention and Control of Infection in Healthcare (NHMRC, 2019). There are extensive national and jurisdictional COVID-19 guidelines and resources. (Australian Government Department of Health, 2020)

COVID-19 Transmission

There are three commonly accepted modes of viral transmission;

1. direct contact with contaminated surfaces (fomites),
2. larger respiratory droplets
3. smaller micro-droplets known as aerosols.

In the context of SARS-CoV2 there has been intense debate and increasing evidence about airborne transmission. Healthcare workers constitute a substantial proportion of all COVID-19 infections in Australia, and data from Victoria suggests that the majority of HCWs acquired it in the workplace. HCW infections lead to infection in other HCW's, close contacts and patients. Subsequent staff furlough have a significant impact on workforce sustainability.

Given the uncertainty regarding the mode of transmission, we **recommend** the application of a precautionary principle in infection-control decision making, taking into consideration the possibility of airborne transmission of SARS-CoV-2.

Engineering Controls

Introduction

Engineering controls are designed to remove the hazard at the source before it comes into contact with the worker and can be very effective as long as these are designed, used and maintained properly. Engineering controls include:

- Process controls - Change the way an activity or process is performed to reduce the risk of transmission.
- Enclosure and isolation - Ensures separation between the patient and the HCW.
- Ventilation - Moves outdoor air into a building or a room, and distributes the air within the building or room.

Patients are placed in higher-order engineering control areas before using lower-order areas. Patient care areas include:

- Class N rooms are negative pressure isolation rooms used to isolate patients capable of transmitting airborne infection. A Class N room should have a functional anteroom for donning and doffing PPE. Airborne PPE precautions are still required. Doffing is performed in the anteroom. There are a limited number of negative pressure rooms across Australia and New Zealand.
- Class S rooms are standard rooms which can be used for isolating patients capable of transmitting infection by droplet or contact routes. Class S rooms have no negative pressure capability. Airborne droplets can remain in the air for up to three hours post procedure. These rooms should have engineering reviews for optimising airflow and air exchanges.
- Open Cohort Areas have no negative pressure capability. These areas should have engineering review for optimising airflow and air exchanges. In an open ICU cohorted area with one or more COVID-19 patients, the whole area is **recommended** to require airborne PPE precautions with careful attention to the clear designation of safe donning and doffing areas.

We **recommend** COVID-19 patients ideally be treated in a Class N negative pressure single room. If Class N rooms are not available then the preference should be Class S single rooms (with appropriate engineering considerations) with clear areas demarcated for donning and doffing of PPE.

Once all Class N and Class S rooms are exhausted, then consideration could be given to moving patients to a facility with available Class N or Class S rooms. If not possible, patients will need to be cohorted in areas that are physically separate to areas containing non-COVID-19 patients.

We **recommend** that aerosol-generating procedures (AGP) are performed in Class N rooms. If performed in a Class S room or cohorted area, engineering controls should be optimised for rooms selected for this purpose. This should include exhausting air conditioning to an external point and at least 6, ideally 12, air exchanges per hour.

General Ventilation System Considerations

Intensive care heating, ventilation and air-conditioning (HVAC) systems are critical to maintaining good 'indoor air quality' and reducing the transmission of airborne disease. Older intensive care units may not meet current standards with lower number of air changes per hour (ACR) and ventilation systems with re-circulation.

We **recommend** hospital engineering advice should be sought to explore configuring HVAC systems to increase the air changes per hour (ACR) with the outside and avoiding air recirculation, incorporating HEPA filters within existing HVAC systems and changing indoor airflow patterns e.g. vertical rather than laminar flow. Temporary negative pressure rooms could be set up with the use of portable negative air units fitted with a high efficiency particulate air (HEPA) filter.

We **recommend** engineering support help advise hospitals on whether this is logistically possible.

Future Intensive Care Unit Design

Future intensive care unit developments should incorporate contemporary engineering control design suitable for pandemics. These engineering control designs should comply with an agreed national and jurisdictional standard. This standard should include the HVAC system, a defined ratio of negative pressure rooms to standard Class S rooms, a high proportion of single rooms and the ability to isolate areas as pandemic/isolation pods for larger intensive cares. Local hospital developments should identify areas that can be used for intensive care surge capacity in the event of a future pandemic.

Administrative Controls

Administrative controls change the way health care workers work to reduce the risk of COVID-19 infection. These workflows include ways to minimise viral exposure and reduce the risk of HCW and patient infection.

Minimise HCW contact viral exposure with Suspected and Confirmed COVID-19 patients.

We **recommend** that all patients are assessed for potential COVID-19 infection. Patient screening should be in line with the latest national recommendations for COVID-19 case definition and should include determination of clinical history, contact and travel history. Patients deemed at risk should be isolated and tested for COVID-19.

We **recommend** that workflows be established to minimise the number of staff and minimise the duration and frequency of entry into a COVID-19 room or area. This may involve the bundling of clinical activities and the use of video monitoring.

We **recommend** in ICU, that all HCWs not directly involved in patient care (e.g. dietary, administrative staff, students) where possible be excluded. We **recommend** transferring care of patients in the ICU to an admitting intensive care specialist to limit the need for the attendance of other medical teams within the ICU. We also **recommend** that other medical teams use teleconferencing preferentially and only visit intensive care if absolutely necessary, and with the absolute minimum of staff.

We concur, with appropriate and safe PPE precautions, staff can be rostered between clean and COVID-19 teams. If staffing permits, a dedicated roster could be explored to segregate clean and isolation teams, with provision for standby staff.

Reduce HCW Cross-infection with COVID-19

To reduce cross infection, we **recommend** cancelling face-to-face meetings as much as possible. For meetings with operational, clinical or education value we recommend that secure video-conferencing applications are provided and utilised.

As the incidence of COVID-19 increases, there is a risk of a HCW becoming infected while caring for a patient with unrecognized COVID-19 or having contact with an asymptomatic or minimally symptomatic HCW with COVID-19. We **recommend** checking staff temperatures at the start of each shift. We **recommend** a staff log for staff rest areas or clinical areas be maintained to ensure contact tracing controls can be easily established if required.

We **recommend** rest and work areas be compliant with social distancing guidelines. Depending on the community transmission, the recommendation for staff wearing surgical masks will change. During periods of increased community transmission, we **recommend** enhanced infection control measures such as the blanket use of face masks. In COVID-19 areas within the ICU (e.g. clinical areas with no identified COVID-19 patients, simulation rooms) where social distancing is difficult to achieve, we **recommend** that staff wear surgical masks. In rest areas where compliance with social distancing is not possible, we **recommend** adjusting the physical environment to ensure social distancing.

Avoid COVID-19 HCW Infection from the Environment

To avoid environmental cross-contamination the following is **recommended** to minimise the risk of contamination of staff via equipment:

- Avoid sharing ICU equipment. Preferentially use only single-use equipment.
- Minimise personal effects taken to the workplace.
- Any personal devices taken into a COVID-19 area are subject to infection control cleaning as per local guidelines.
- Stethoscope use should be minimised.

We **recommend** that:

- Clean scrubs are available to change into before each shift.
- Staff have access to change areas and showering facilities.

We **recommend** that cleaning of clinical and non-clinical areas complies with national and jurisdictional standards for COVID-19 infection control. We **recommend** that staff providing cleaning and ancillary services are provided with appropriate training and supervision in PPE.

Robust Visitor Screening and Management

Given the stress on families with a loved one in intensive care, processes around patient visits must be communicated clearly and compassionately to visitors with an emphasis on the protection of patients, families and staff. All visitors to ICU **must** be screened for potential COVID-19 infection. Criteria should be based on national recommendations and include assessment of clinical history, contact and travel history. At a minimum, visitors with a temperature or respiratory symptoms should not be allowed to attend a patient.

We **recommend** hospitals maintain a hospital visitor log to allow for contact tracing and activity mapping of confirmed cases. Communication to families and visitors should include posting visual alerts (e.g. posters) at the entrance and in strategic places (e.g. waiting areas, elevators) advising visitors not to enter the facility when ill.

We **recommend** visitors should be limited as per local guidelines. In areas of high community transmission, it may be necessary to further limit visitor duration and numbers. If visitors are entering COVID-19 areas, we **recommend** they wear appropriate PPE and observe airborne precautions.

Personal Protection Equipment (PPE)

Administrative Control Considerations Related to PPE

In ICU there is an increased risk of dispersion of aerosolised virus into the healthcare environment due to the nature of critical illness, higher viral load and the performance of aerosol-generating procedures. We **recommend** contact and airborne PPE precautions be used to care for all COVID-19 patients in intensive care, including the care of patients in an open cohorted ICU. We also **recommend** intensive care staff adhere to contact and airborne PPE precautions for the assessment or care of COVID-19 patients in any location within the hospital.

We **recommend** that all hospitals should keep a record and report staff training in PPE compliance and competency; only staff who have been trained in PPE usage should care for patients with COVID-19. We **recommend** that there is a system in place to ensure compliance with changes in PPE recommendations.

We **recommend** minimising aerosol generating procedures (AGP). If they must be performed, then they should be completed in a negative pressure room (Class N room). If this is not available, then a single room (Class S) should be used. We **recommend** airborne PPE precautions for HCW's in proximity to AGP. Aerosol generating procedures (AGP) include:

- Intubation
- Extubation
- Bronchoscopy
- High flow nasal oxygen use
- Nebulised therapies
- Non-invasive ventilation (particularly with a poorly fitting mask)
- Procedures on screaming children
- Tracheostomy
- CPR prior to intubation.

There is uncertainty whether other patient behaviours, such as shouting, are AGP's.

Powered Air Purifying Respirators (PAPR) are above the recommended standard for staff protection against COVID-19. However, in units where their use is already in place and appropriate training is available, they may be considered for AGP such as semi-elective intubations or prolonged continuous care of non-intubated patients. One benefit of PAPR is they do not necessarily rely on a proper seal, thus for those conducting AGP procedures the risks associated with ill-fitting N95 masks are reduced. Although expensive, some can be disinfected and reused. Furthermore, the use of PAPR helmets may free up supplies of face shields and disposable N95 masks. Donning and doffing of these devices may be complex, and the risk of viral dispersal during the doffing process must be weighed against any benefit of the device.

Training in PPE

We **recommend** that all intensive care personnel (medical, nursing, allied health, cleaning and ward assistants) receive training in infection control and personal protection equipment. In order for an N95 mask to offer the desired protection, it is important that there is a correct facial fit. The two distinct procedures used to achieve this are referred to as the 'fit test' and the 'fit check'.

We **recommend** that *fit checking* for an appropriate mask seal be performed every time a HCW applies a new N95 mask. The manufacturer's instructions for fit checking of individual brands and types of N95 respirator should be referred to at all times. N95 masks should not require excessive manipulation to achieve a seal.

The purpose of *fit testing* is to identify which size and style of N95 is suitable for an individual. It also provides an opportunity to ensure healthcare workers are properly trained in the correct use of the mask. As per the 'Australian Guidelines for the Prevention and Control of Infection in Healthcare', we **recommend** fit testing of N95 masks. If staff are unable to achieve a fit test with available N95 masks, then we **recommend** the staff member be redeployed. If this is not possible due to the affected staff member performing a vital function in the ICU, then the use of PAPR could be considered.

We **recommend** the use of interdisciplinary small group simulation to practice and improve COVID-19 clinical processes and staff training in PPE.

Application of PPE

We **recommend** that when a unit is caring for a confirmed or suspected COVID-19 patient that all donning and doffing is supervised by a dedicated PPE spotter to decrease staff COVID-19 infection and furloughing. The dedicated PPE spotter is a specifically trained staff member (not necessarily an intensive care staff member) whose role is to supervise donning and doffing and monitor for any breaches in PPE safety, provide education and feedback to improve performance. Where a PPE spotter is unavailable, supervision of PPE application and removal should still occur but may have to be done using a "buddy" system.

Specific recommendations for airborne precautions should follow jurisdictional infection control guidelines including fit checked N95 mask, face shield, impervious gown and gloves. In addition, the following can be **considered**:

- Hair cover for AGP
- Shoes that are impermeable to liquids.

Recurrent use of shoe covers is **not recommended** as repeated removal is likely to increase the risk of staff contamination.

Maintaining the Supply of PPE

Any strategy to successfully maintain the supply of PPE during the COVID-19 pandemic needs an understanding of current PPE inventory, current and future supply, with rational and appropriate use.

Current PPE Inventory

Uncertainty in PPE inventory and supply causes anxiety in the frontline workforce. We **recommend** a national and jurisdictional approach which is transparent. We **recommend** the establishment of a clear PPE governance structure to include transparency on current inventory and supply, an escalation process in the case of critical PPE shortages and decision-making pathways which are responsive to local demand with communication to and from frontline staff.

Coordinate PPE Supply Chain Management Mechanisms

Due to increasing international demand, sourcing a reliable supply requires the current strategies of re-establishing previous supply chains, developing new supply chains and increasing local production.

Rational and Appropriate Use of PPE

The same measures to minimise overall staff exposure to COVID-19 also reduce PPE demand. We **recommend** that all facilities implement the previously mentioned measures to minimise overall staff exposure which also **reduce PPE demand** including:

- Excluding HCW not essential for patient care from entering their care area.
- Transferring care to an admitting intensive care specialist to minimise staff entry in the COVID-19 intensive care unit.
- Reducing face-to-face HCW encounters with patients.
- Cohorting patients.
- Maximizing the use of telemedicine.
- Reducing the number of patients going to the hospital or outpatient settings.

We **recommend** prioritisation and rapid testing of intensive care patients with suspected COVID-19 to minimise the use of unnecessary PPE.

We also **recommend** that the PPE conservation strategies be implemented as listed in Table 3. We do **not recommend** any local facility policies to pre-emptively preserve PPE that reduce the occupational health and safety of health care workers.

Table 3 - Potential PPE conservation strategies. Adapted from (Centers for Disease Control and Prevention, 2020; Livingston et al., 2020; World Health Organization, 2020)

Strategy	Comments and suggestions
Monitor and control usage at the bedside	<p>Allocate PPE to HCW at the start of shift.</p> <p>Replace PPE in an accountable and easily available manner in the event of contamination.</p> <p>All PPE to be stored in a secure and monitored location.</p> <p>Daily audits and reporting on stock levels.</p>
Reduce patient contact	<p>'Bundling' care interventions on all COVID-19 patients, this can include medication administration, pressure area care, suctioning and other such procedures.</p> <p>Utilise mobile and out-of-room monitoring and device controls, including infusion pumps with extension tubing and some ventilator consoles if feasible.</p>
Reduce student teaching	No student patient contact unless on a dedicated roster.
Reduce Non-essential HCW to patient contact	Only necessary and minimal HCW to enter the patient area/room, such as one medical staff for patient examination
Reduce non-essential services	Cancel elective and ambulatory procedures.
Cohorting confirmed COVID-19 patients	HCW to use the same PPE between patients without the necessity of donning and doffing. Double glove and change outer glove between patients.
Reusable PPE	<p>PAPR masks are a good strategy for reusable equipment.</p> <p>Reusable elastomeric respirators (have exchangeable filter cartridges) that are able to be appropriately cleaned and disinfected between users. They are likely to create a better and more reliable facial seal than disposable N95 masks.</p>
Reduce PPE use	<p>Goggles and face shields may be used for extended time, placing it on at the beginning of the shift and removed and disposed of for breaks or when contaminated.</p> <p>N95 masks can be used for up to four hours without removal, unless soiled or contaminated. Wearing masks for longer than this can lead to considerable discomfort.</p> <p>Mask seal checks should be performed prior to each entry into the patient space.</p>
Reusable goggle & face shield PPE use	Use goggles or face shields that are able to be appropriately cleaned and disinfected between users.

We do **not** recommend:

- Using face mask PPE that has expired beyond its shelf-life.
- Continuous use in consecutive patients of N95 masks with storage in a 'Ziplock' bag for next use.
- Use of repurposed equipment such as sewn fabric masks and gowns.

Gowns, gloves and disposable N95 masks are designed for single use. There is significant global interest in strategies to reuse N95 masks after sterilisation. Currently, due to a lack of evidence, these strategies are **not recommended**.

Metrics for Staff Safety and Sustainability - PPE

PPE Metrics are part of clear communication directly from the hospital, the intensive care and the frontline staff.

We **recommend** that ICUs document and report their daily usage of

- N95/P2 face masks,
- surgical face masks,
- long sleeve impermeable gowns, and
- face shield/goggles in order to calculate intensive care PPE burn rate.

We also **recommend** that each intensive care unit document and report daily PPE on three levels -

- use of nonstandard and improvised PPE, use of standard PPE but with immediate supply concerns, and
- use of standard PPE and no supply concerns.

We **recommend** that hospitals should, on a daily basis, estimate the number of days of PPE supply that is available for current patient load, aiming to maintain a supply of 3 to 7 days. We **recommend** that if a hospital has a critically low PPE supply anticipated to last less than 2 days, that a jurisdictionally defined alert state be activated, including immediate escalation to the hospital Chief Executive Officer and the relevant State Coordination body. Remote, rural and regional centres will need to factor in extra days for a resupply, as compared to a metropolitan centre.

Special Situations for Staff Safety in COVID-19 Patients

Airway Management

We are aware of multiple comprehensive guidelines for airway management in COVID-19 patients. We **recommend** the following principles for intubation of a proven or suspected patient with COVID-19 to minimise HCW infection:

- Intubation should preferentially be performed in a negative pressure room (Class N) or if not available then a single room should be used (Class S).
- We **recommend** airborne PPE precautions for all staff in attendance including:
 - Fit checked N95 mask
 - Face shield
 - Impervious gown
 - Gloves.
- The procedure should be performed by the most qualified available staff with the minimum number of healthcare personnel present as are required to undertake a safe intubation.
- Video laryngoscopes should be used preferentially and staff should be trained and familiar with these devices.
- To reduce aerosol generation staff should consider:
 - Optimising pre-oxygenation to reduce the need for rescue interventions.
 - Use of a viral filter on bag mask circuit.
 - Minimising the need for bag mask ventilation unless there is significant hypoxia or acidosis.
 - Post intubation, provision of positive pressure ventilation (either by bagging circuit or ventilator) be initiated only after confirming that the endotracheal tube cuff is inflated and after ensuring that an appropriate filter and waveform capnography device is in place.

Extubation

We recommend the following principles for extubation of a patient with COVID-19 to minimise HCW infection and improve outcome and safety:

- Extubation should ideally take place in a negative pressure room.
- Minimise the number of staff in the room, with staff available outside the room for emergencies.
- Staff should observe airborne precautions, with appropriate PPE, at all times.
- Adequately trained staff for re-intubation should be available.

Failed extubation in COVID-19 patients is potentially a high risk situation for HCW infection. Consideration should be given to optimisation of clinical status, spontaneous breathing trials and time of day for extubation to ensure the best possibility of a successful extubation and availability of senior staff if re-intubation is needed.

Percutaneous Tracheostomy

Tracheostomy is often required to facilitate weaning from mechanical ventilation. The benefits of the procedure need to be balanced against the risk to health care workers posed by performing this aerosolising procedure. We are not aware of any evidence to guide the ideal timing of tracheostomy in COVID-19 patients, however we would **recommend** that tracheostomy should not be performed before 10 days of mechanical ventilation.

Cardiopulmonary Resuscitation

Cardiopulmonary resuscitation is considered an aerosol generating procedure. We **recommend**:

- Hospitals review their approach to cardiopulmonary resuscitation (CPR) on the ward, for patients with COVID-19, as well as the general ward population during periods of extensive community transmission.
- Identify as early as possible any patients with a COVID-19 like illness, who are at risk of acute deterioration or cardiac arrest. Take appropriate steps to prevent cardiac arrest and avoid unprotected CPR.
- Patients must have clear goals of care (including NFR/intubation status) documented by the treating consultant on admission to the ward.
- Personal Protective Equipment (PPE) be made readily available to protect staff during resuscitation attempts.
- Do not enter COVID-19 room/area until donning airborne PPE.
- It is acknowledged that donning may cause a delay to starting chest compressions, but the safety of staff is paramount.
- If a defibrillator is readily available defibrillate shockable rhythms rapidly prior to starting chest compressions. The early restoration of circulation may prevent the need for further resuscitation measures.
- Do not listen or feel for breathing by placing your ear and cheek close to the patient's mouth. Do not perform mouth-to-mouth ventilation or use a pocket mask.
- Start compression-only CPR and monitor the patient's cardiac arrest rhythm as soon as possible.
- If the patient is already receiving supplemental oxygen therapy using a face mask, leave the mask on the patient's face during chest compressions as this may limit aerosol spread. If not in situ, but one is readily available, put a mask on the patient's face.
- Restrict the number of staff in the room (if a single room) with the assistance of a gatekeeper. A mechanical CPR device (e.g. LUCAS) may help to facilitate this during prolonged CPR.
- We **recommend** a "buddy check" system to ensure donning and doffing is appropriate. Ideally, every resuscitation will be assigned a "safety officer" whose only responsibility is overseeing the safety of the staff including fulfilling the role of PPE spotter.

Staff Wellbeing

A focus on the care and protection of staff is absolutely vital for staff well-being to ensure a safe, sustainable workforce and to maintain high quality clinical care. It should be recognised that intensive care staff will likely have an increased workload with heightened anxiety both at work and at home.

In periods of social disruption, such as school closures, we **recommend** health care workers are supported by appropriate measures to ensure that they can still attend work. This could include access to additional paid leave being provided to partners of health care workers, shorter shifts to accommodate caring for children or extended care leave if caring for COVID-19 positive family members.

We **recommend** that hospitals have the following available for all staff in intensive care:

- Clean scrubs available to change into before each shift
- Access to change areas and showering facilities
- Rest breaks and rest areas compliant with social distancing guidelines
- Provision of meals and drinks for frontline staff to boost morale and minimise staff leaving the hospital for meals.

Staffing

The rapid upskilling and rostering of non-critical care trained staff carries risk of increased morbidity and mortality. We **recommend** that the intensive care representative bodies ACCCN, CICM and ANZICS formulate models that enable a surge workforce to deliver safe care.

We **recommend** measures to reduce fatigue and improve mental health of all ICU staff during a protracted pandemic response. Examples of ways to reduce fatigue include:

- creating rosters with shorter shifts
- limiting exposure to high risk areas
- consideration of smaller pods.

We **recommend** partnering less experienced staff with more experienced staff and for ICU-trained registered nurses to be available to supervise non-ICU trained registered nurses. We **recommend** rostering adequate time off between shifts. We acknowledge the benefit of team debriefs or huddles at the beginning and end of each shift.

Staff Illness

Staff who are ill should follow national guidelines in regard to self-isolation and testing for COVID-19. We **recommend** prioritising testing for COVID-19 in health care workers to minimise the time away from the workforce.

Post Exposure Management

It is **recommended** every observed breach in PPE usage is recorded in the incident management system as an occupational health and safety risk. ANZICS recognises that breaches will occur despite best efforts and no blame should be apportioned to the individuals involved.

If an exposure or breach of PPE occurs, assessment and risk categorisation of the staff member should be done in accordance with national guidelines and local policy. Based on risk of exposure the appropriate further management should be commenced immediately including a quarantine/self-isolation period. We **recommend** staff should be provided with funded accommodation if they are unable to self-isolate in their own home.

For either staff illness or post exposure management we **recommend** the provision of adequate psychosocial support for the staff member during quarantine or for the duration of their illness. On return to work a refresher infection control and prevention training should be offered for the staff member.

We also **recommend** that each nosocomial health care worker COVID-19 infection is entered into the local and jurisdictional incident management system as a notifiable sentinel event. We **recommend** that each COVID-19 HCW infection is independently reviewed with adjudication of source and the mechanism of infection. A common cause analysis would identify the preventable factors and system changes to decrease HCW infections.

Staff Information and Education

We **recommend** the use of online education courses for upskilling of critical care junior medical and nursing staff.

We **recommend** team debriefs or huddles at the beginning of each shift that include:

- Are you well?
- Check in "Are you OK?"
- Update any changes in workflow, policies and procedures.
- PPE refresher on "donning" and "doffing". This is recommended to be a watch and observe training rather than hands-on assessment.

Staff Members at Higher Risk from COVID-19 Infection

The international experience is that mortality is higher in older patients, particularly with comorbidities related to cardiovascular disease, diabetes mellitus, chronic respiratory diseases, hypertension and malignancy. We **recommend** that staff who are judged to be of high risk should not enter the COVID-19 isolation area. This includes staff who are pregnant, have significant chronic cardiac and respiratory illnesses or are immunosuppressed.

Staff member risk decisions should be made on a case-by-case basis by the unit director with the support of the local occupational health and safety unit. We **recommend** that these staff be reallocated to other roles and not enter COVID-19 areas.

Psychosocial Considerations

The COVID-19 pandemic is causing a great deal of uncertainty and fear in our community, as well as amongst ICU staff. The need for ICU staff to recognise stress and burn out in themselves, to look out for colleagues and friends while maintaining mental and psycho-social wellbeing during this time is paramount. Focusing on the psychosocial wellbeing of people who care for the critically ill is fundamental to high performance teams in addition to the availability of ventilators and beds.

We **recommend** within each intensive care unit there is regular monitoring of staff wellness.

We **recommend** ICU staff have mental health and psychosocial services available to them that can be accessed confidentially and free of charge. Team leaders and intensive care managers should implement start of shift recommendations listed above as well as the following recommendations:

- Emphasise appreciation to ICU staff to protect against chronic stress and poor mental health.
- Offer shorter shifts, particularly for nursing staff covering extra shifts.
- Organise psychological drop-ins in the workplace to check-in with staff.
- Offer well-being checks at home via phone call for staff.
- Ensure good quality communication and regular, accurate information updates, including updates on current PPE supply.
- Ensure staff are aware of where they can access mental health and psychosocial support services.
- Plan for periods of recovery, including debriefing, psychological support and leave for staff once workload in the COVID-19 pandemic settles.

The first step in dealing with the symptoms of anxiety and stress on the frontline is a recognition that they are normal and expected. These symptoms are:

- Being stressed or overwhelmed
- A loss of order or control, feelings of panic
- Anxiety, fear, helplessness, moral distress
- Feeling isolated and withdrawn
- Having difficulty concentrating or sleeping
- Having physical symptoms, such as nausea or lethargy
- Having exhaustion and burnout
- Comfort eating or lack of appetite.

We suggest a number of strategies to support and care for one’s own wellbeing. These strategies are listed in table 3.

Table 3 - Strategies to support and care for one’s own wellbeing

Understanding the facts	Caring for oneself outside of work	Staying connected
<p>Limit exposure to the constant streams of news.</p> <p>Seek information from trusted and practical resources.</p> <p>Distinguish facts from rumours and misinformation.</p> <p>Beware of dramatic language, this might panic colleagues or reinforce fear in oneself.</p> <p>Keep things in perspective and stay calm.</p>	<p>Maintain one’s health, through eating good natural foods, ensuring sufficient rest between shifts and regular exercise.</p> <p>Use strategies to de-stress that have worked for you in the past.</p> <p>Engage in activities that bring joy and are relaxing.</p> <p>Find time to connect with nature, such as fresh air through an open window if you are unable to get outside.</p> <p>Avoid using unhelpful coping strategies such as smoking, alcohol or drugs to alleviate your stress.</p>	<p>Stay connected with your friends and family via email, social media, video conference and telephone.</p> <p>Turn to colleagues, managers or other trusted persons for social support – many may be feeling similarly to you.</p> <p>Treat colleagues with compassion, acknowledge each other’s fears and encourage each other to openly discuss vulnerabilities.</p> <p>Try to find joy amidst chaos.</p> <p>Connect with colleagues to share stories of success, rather than focusing on failures and stresses.</p>

Well-being and psychosocial supports for ICU staff working during the COVID-19 pandemic are listed in appendix 3.

We acknowledge that there are concerns over transmission of COVID-19 to those at home. This risk can be reduced by attention to workflows at work and at home as suggested in appendix 4.

Metrics for Staff Safety and Sustainability - Staff wellbeing

We **recommend** that the intensive care unit daily collect and record the number of staff on sick leave due to COVID-19 infection and the number of staff on sick leave for reasons other than COVID-19 infection.

Appendix 1

Levels of Critical Care Capability in Remote, Rural and Regional Areas

Health Care Facility / Hospital	Resources available
Hospitals with an intensivist led/staffed ICU who regularly provide the full range of critical care support but lack on-site access to the full range of sub-speciality support.	<ul style="list-style-type: none">• ICUs accredited with the College of Intensive Care Medicine.
Hospitals with an ICU led/staffed by non-Intensivists who regularly provide critical care support with the occasional assistance of a larger centre.	<ul style="list-style-type: none">• Staffed by medical, nursing and allied health critical care personnel with intermittent or regular transient or remote support from a FCICM.• Can extend to intermediate-term ventilatory support capabilities(e.g. in Emergency Department, HDU, ICU or operating theatres) depending on clinical space and engineering.• Less variable critical care staffing mix who may or may not have other clinical duties and may require additional external support.• Usual remote critical care support is through established telehealth or critical care retrieval services.
Hospitals with established Emergency Departments, HDUs or theatres who regularly provide critical care on a short term basis.	<ul style="list-style-type: none">• Staffed by medical, nursing and allied health generalists, including remote area nurses, advanced practitioners, anaesthetists, general practice anaesthetists, emergency department physicians and rural hospital generalists.• Short term ventilatory support capabilities (e.g. in operating theatres).• Variable critical care staffing mix on a shift-by-shift basis.• Remote critical care support is usually through critical care retrieval services.
Hospitals with none of the above.	<ul style="list-style-type: none">• Limited capacity to provide any critical care support.

Appendix 2

Checklist for ANZICS “Planning for a Pandemic” Guideline

Minimising ICU Demand	✓
ANZICS recommends	
Deferment or cancellation of non-urgent elective surgery. Protocols and mechanisms should be established for a staged, progressive cancellation of elective surgery.	<input type="radio"/>
Developing cooperative agreements with other health services. Discussions with other health services (e.g. private hospitals) should be held to facilitate the transfer and care of appropriate patients.	<input type="radio"/>
Identifying alternative areas for patient monitoring. Alternate areas capable of providing a higher level of monitoring should be identified.	<input type="radio"/>
Increasing ICU Capacity (space)	✓
ANZICS recommends	
Identifying alternative areas with the physical infrastructure for the care of critically ill patients. Areas with the capability to care for non-ventilated or ventilated patients should be identified early, together with processes to enable expeditious repurposing for ICU utilisation.	<input type="radio"/>
Quantifying stock of equipment, including consumables and disposables, and identifying appropriate channels for procurement and storage.	<input type="radio"/>
Reviewing ICU and Organisational Discharge Processes. Mechanisms and processes should be established to facilitate safe discharge of patients from ICU during a surge in demand, together with organisation-wide efforts to improve patient flow.	<input type="radio"/>
Increasing ICU Capacity (workforce)	✓
ANZICS recommends	
Identifying nursing staff capable of caring for critically ill patients. Nurses from a variety of backgrounds may be redeployed to the ICU under the supervision of experienced ICU nurses.	<input type="radio"/>
Developing a rapid ICU orientation programme for nurses. Nurses being redeployed to the ICU would need to undergo a rapid orientation program in order to facilitate their transition into the critical care environment.	<input type="radio"/>
Identifying medical staff who can be suitably redeployed from other specialties.	<input type="radio"/>
Identifying allied health staff who can be suitably redeployed to the ICU. Additional physiotherapists, pharmacists and social workers would be required to support the care of critically ill patients and their families.	<input type="radio"/>

Increasing ICU Capacity (Workforce) (continued)	✓
ANZICS recommends	
Streamlining administrative on-boarding processes.	
Standard protocols need to be rationalised and streamlined to facilitate efficient onboarding of new staff members.	<input type="radio"/>
Preparing strategies to maintain staff morale.	
Providing support through a variety of means (e.g. psychological support, accommodation) is imperative to maintain staff morale.	<input type="radio"/>
Effective communication	✓
ANZICS recommends	
Establishing an information management plan.	
Methods of efficient dissemination of new information should be established, utilising a variety of platforms.	<input type="radio"/>
Identifying and maintaining key lines of communication.	
Key stakeholders and methods of communicating with them must be established to respond rapidly to a surge in clinical demand.	<input type="radio"/>
Developing a strategy for decision-making about ICU admission	✓
ANZICS recommends	
Ensuring ICU medical staff have a shared decision-making model.	
Senior ICU medical staff should have discussions on developing a common approach to decision-making regarding ICU admissions and treatment.	<input type="radio"/>
Rural and Regional ICUs	✓
ANZICS recommends	
Plan for workforce shortages and expand telehealth services.	<input type="radio"/>
Nominate a local COVID-19 leadership group.	<input type="radio"/>
Management of the deteriorating patient	✓
ANZICS recommends	
Reviewing Rapid Response (RRT)/Medical Emergency Team (MET) models.	
Alternative RRT/MET models involving delegation of roles to non-ICU services should be explored.	<input type="radio"/>
Ensuring all patients have a goals of care (or equivalent) form completed with an appropriate plan for escalation of treatment.	<input type="radio"/>
Facilitating Emergency Department Management	✓
ANZICS recommends	
Early referral to ICU to facilitate emergency department flow.	<input type="radio"/>

Appendix 3

Support resources to provide to all intensive care staff

Type	Supports
Departmental Support	Deploy designated “Wellness Champion(s)” to follow up on staff Assign mentors to junior staff
External confidential counselling services via phone/email/video chat	Employee Assistance Program - Converge International www.convergeinternational.com.au
Medical staff support	Drs4Drs Doctors health service providing information for independent state programs WHO Mental Health and Psychosocial considerations during COVID-19 Outbreak (www.who.int/docs/default-source/coronaviruse/mental-health-considerations.pdf)
Other supports	Free mindfulness apps, e.g. Headspace, TREAT, Breathing, CALM Beyond Blue: 1300 224 636 Local GP - mental health plans If emergency assistance is required, dial 000 or call LifeLine on 13 11 14

See the ANZICS website for updated resources.

Appendix 4

Reducing risk of transmission to those at home

We acknowledge that there are concerns over transmission of COVID-19 to those at home. This risk can be reduced by attention to workflows that reduce the risk of inadvertent breaches in PPE. The following practices are suggested to reduce likelihood of transmission to others.

Prior to work.

- Avoid bringing all non-essential items into the clinical workspace. This includes: reusable coffee cups, laptops, wallets and unnecessary papers. Consider placing your driver's licence, mobile and credit cards into a clear sealed bag at the commencement of each shift.
- Remove watches, rings and earrings larger than a small stud.
- Essential items include: hospital ID badge, name badge, pen and mobile phone (consider removing case to make cleaning easier).

At work.

- All essential items should be considered potentially contaminated. They should be regularly cleaned with antibacterial or alcohol wipes throughout the shift. Avoid contaminating shared workspaces. Clean all personal items such as stethoscopes, mobile phones and name tags with hospital grade disinfectant.
- Avoid taking a mobile phone out of your pocket while working.
- Avoid contaminating clothing and items that will return home. We recommend travelling to work in personal clothing and changing to hospital-supplied scrubs on arrival.
- Wear shoes that can be cleaned, either leave at work or leave outside when returning home.
- If wearing personal scrubs, change into a new set of clothes prior to going home and put "dirty" scrubs in a plastic bag to take home to wash.
- Maintain hand hygiene and social distancing. This is vital to prevent the spread of COVID-19, but also serves to reassure stressed and concerned staff, patients and visitors.
- Increase frequency of hospital cleaning services to clean commonly touched surfaces such as keyboards, door handles and light switches.

At home. The following actions should precede any interactions with the people you live with:

- Avoid bringing any items into the home that had previously been at work.
- Remove and wash clothing (with hot water). Immediately shower and change into clean clothes.
- Clean frequently touched surfaces in your car, including steering wheel, door handles, mirrors, screens and gear shift.
- Family members or household contacts of HCW involved in the care of suspected or confirmed covid-19 patients should consider sleeping in a separate room and using a separate bathroom, if they belong to a high risk group.
- All members of the household should practice meticulous hand hygiene and wash hands and commonly used surfaces regularly.

Appendix 5

Checklist for Staff Safety and Sustainability

Infection control measures (engineering)	✓
ANZICS recommends	
Developing a plan for patient isolation and cohorting This includes identifying all appropriate Class N and S rooms, and a plan for cohorting of patients once these rooms are exhausted.	<input type="radio"/>
Infection control measures (administration)	✓
ANZICS recommends	
Ensuring all patients are screened and tested in line with national recommendations	<input type="radio"/>
Maintaining a record of PPE training, compliance and competency Only staff who have been appropriately trained should be allowed to care for patients with COVID-19.	<input type="radio"/>
Monitoring health care worker infection and PPE breaches A process for monitoring these sentinel events in infection control should be established.	<input type="radio"/>
Managing ICU visitors A process for limiting and screening visitors and maintaining a visitor log.	<input type="radio"/>
Performing fit-checking for N95, and fit-testing where possible All personnel should be educated in the fit checking of N95 masks.	<input type="radio"/>
Minimising cross contamination and fomite transmission A clear policy on the use of personal effects and other potential fomites should be established.	<input type="radio"/>
Maintaining Staff Wellbeing	✓
ANZICS recommends	
Identifying measures to provide social support to staff Social disruptions such as school closures may affect staff ability to attend work, and measures to mitigate their impact should be considered.	<input type="radio"/>
Addressing food and other issues The availability of scrubs, shower facilities and meals/drinks reduce staff burden, whilst minimising the risk of community spread.	<input type="radio"/>
Developing policies for staff illness, and post-exposure management A protocol for managing and testing staff who may be infected with COVID-19.	<input type="radio"/>
Identifying and redeploying high-risk staff Staff at higher risk of complications from COVID-19 should ideally not enter COVID-19 areas.	<input type="radio"/>
Practicing safe airway management	✓
ANZICS recommends	
Developing a local policy for airway management of patients with COVID-19 Airway guidelines should address the issues how safe airway management can be achieved.	<input type="radio"/>

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