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COVID-19: Workplace Risk Management[1]

The COVID-19 pandemic is an evolving situation. Health professionals should refer to the advice provided by the Australian Department of Health and the Aotearoa New Zealand Ministry of Health websites in the first instance.

This document reflects the following guidance issued by the Australian and Aotearoa New Zealand Governments regarding personal protective equipment) (PPE):

- Australia:
  - National Health and Medical Research Council Guidance for Prevention and Control of Infection in Health Care
  - The Australian Health Protection Principal Committee (AHPPC) Statement on the use of personal protective equipment in hospitals during COVID-19 Outbreak
  - Communicable Diseases Network Australia's (CDNA's) COVID-19 Series of National Guidelines (SoNG)
  - The Australian Infection Control Expert Group, Guidance on the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak
  - Department of Health, Personal protective equipment (PPE) for the health workforce during COVID-19
- Aotearoa New Zealand:
  - Ministry of Health, Personal protective equipment use in health care and disability care settings
  - Ministry of Health, COVID-19: Personal protective equipment for non-health workers
  - Ministry of Health, Frequently asked questions about PPE and COVID-19

In addition, in Australia, the advice provided in this document should be read in conjunction with the advice provided by the Department of Health's Infection Control Expert Group (ICEG) which sets out the overarching principles for infection prevention and control that should be followed.

Purpose

The Australasian Faculty of Occupational and Environmental Medicine (AFOEM) of the Royal Australasian College of Physicians (RACP), recognises the health threats posed by COVID-19 to the Australian and Aotearoa New Zealand populations.

The purpose of this document is to provide guidance on how to implement the principles of infection prevention and control with respect to the SARS-CoV-2 virus, using the hierarchy of controls, a commonly understood framework for managing workplace health and safety risks. This will assist workplaces to manage the risk of COVID-19 on the same terms as any other workplace hazard. There is already advice on infection control measures where the risk of transmission may be very high, such as in hospital wards where COVID-19 patients are being treated. Although applicable for health care settings, this document is primarily for guidance for use in other workplaces.

Application of the hierarchy of controls and the need for and type of PPE required will depend on local circumstances at the time, including levels of community transmission, disease prevalence and local public health directives.

In Australia, the Department of Health's Infection Control Expert Group (ICEG) provides overarching guidance and principles with regard to infection prevention and control issues. This document should be read and applied in conjunction with the ICEG's advice.

[1] *Note:All hyperlinks in this document are current as of 28 July 2020.*

Background: the hierarchy of controls and COVID-19

The rapid spread of COVID-19, the inability to immediately identify infected people, the potential for spread by asymptomatic and presymptomatic individuals, and the deaths of otherwise healthy individuals has resulted in widespread fear and anxiety worldwide, amid at times devastating social disruption. At the same time, it has been shown that COVID-19 controls such as ceasing overseas travel, working from home, physical distancing, cough etiquette and hand hygiene, are highly effective in reducing its spread and prevalence, **even without personal protective equipment (PPE)**.

However, it is essential to note that:

- For as long at the SARS-CoV-2 virus remains present in the population, **any** non-compliance with these measures may still lead to COVID-19 outbreaks, which will demand an immediate and intensive public health infection control response.
- As the **least effective** means of preventing the SARS-CoV-2 virus from spreading, (PPE) should **only** be used when it is **not** possible to comply with the aforementioned measures.

The latter means that the need for PPE is **critical** for workers who are **least** able to comply with the **most** effective **non**-PPE controls. This especially refers those who are most likely to be exposed to the SARS-CoV-2 virus, such as those in the health, aged care and emergency services.

While general practitioners and hospital workers are therefore likely to be major PPE users, consideration also should be given to HCW such as:

- dentists, and specialists such as respiratory physicians, ear, nose and throat surgeons, and ophthalmologists, physiotherapists and other allied health professionals who routinely have close contact with potentially infected patients.
- Community nurses who undertake home visits to the elderly and disabled.

How to apply this document

Standard precautions for infection control

It is important to note that PPE is **not** a substitute for the application of standard precautions for infection control. These include hand hygiene, cough etiquette and an effective environmental cleaning regime.

Use of PPE

Acertaining **when** PPE should be used, and **what** PPE is required, therefore requires a risk management approach that **reflects the task(s) being undertaken**, based on:

- As far as possible in the **first** instance, implementing the hierarchy of workplace hazard controls for all workplaces task with specific reference to COVID-19 (Table 1).
- Assessing the **residual** risk for each task **after** the heirarchy of controls have been implemented.
- Then assessing **what** PPE to use (if any), in order to control the residual risk for each task (Table 2).

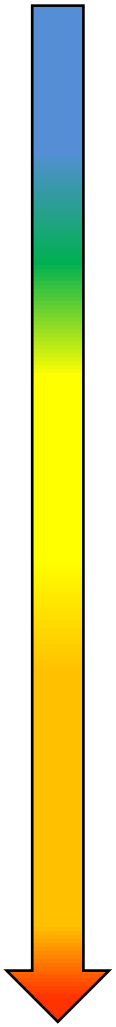
In addition, the higher level of risk posed by Aerosol Generating Procedures (AGPs) means that the PPE for such tasks will require further assessment, based on the frequency and duration of each AGP under consideration (Table 3).

If PPE is required, consideration also should be given to managing the workplace hazards associated with PPE use.

Table 1: Application of the Hierarchy of Controls to controlling COVID-19

This table provides examples of measures for consideration for controlling COVID-19 hazards, **before** considering whether PPE is in fact required.

Most Effective



Least Effective

	Example actions
Remove the potential for exposure to the COVID-19 hazard – the SARS-CoV-2 virus**)**	• Delay non-urgent planned activities. • Screen staff daily on workplace (fever, symptoms). • Remove vulnerable HCWs (as defined per the AFOEM or Australian Department of Health website) from high risk areas (e.g. dedicated COVID-19 wards, EDs, and ICUs to lower risk areas (e.g. non-COVID-19 general medical or surgical wards). • Triage patients with respiratory symptoms and/or travel or contact history in dedicated assessment areas. • Screen, restrict and manage visitors with respiratory symptoms. • Do not perform non-essential higher risk procedures.
Substitution (**Replace processes that create exposure to** hazard**)**	• Use teleconferencing / telehealth / virtual consultations and meetings. • Use non-aerosolising techniques, equipment, and cleaning techniques.
Engineering (**Isolate** people from the hazard**)**	• Install perspex cashier spray guards and distancing spacers, create queue lines with spacing markers. • Use airborne infectious isolation/negative pressure rooms (where available) per the relevant procedures. • Exhaust via HEPA filters with frequent air turnover. • Use closed system ventilators and suction, where possible. • Where possible, move monitoring equipment outside patient rooms; otherwise, it should be specifically dedicated as such and remain in patient rooms. • Aggregate known cases in wards away from non-COVID-19 patients. • Provide covers/booths over patients during transportation (where possible).
Administrative (**Change** how people work with the hazard)	• Implement **non**-engineering physical distancing measures (e.g. card-only payment). • Regular hand hygiene with soap and water and/or hand sanitiser. • Easy access to soap and water and required PPE. • Institute elevator, work break and routine training separation protocols. • Staff risk reduction behaviours when at home or in the community (e.g. social distancing, hand hygiene). • Sick employee policy and staff education on self-care and recognising early symptoms. • Staff education on requirements for isolation following unprotected contact, know who to contact. • Consider how to prevent bringing the virus home (e.g. change and contain work clothes before leaving workplace). • Ensure staff are current on all immunisations (especially influenza). • When higher-risk tasks are being undertaken, restrict number of workers in the room. • Disinfecting protocols for cleaning in clinical and non-clinical areas, focusing on high use/high-touch surfaces. • Policies on transfers of infectious patients.
PPE (Table 2) (**Protect** people from the hazard**)**	• Identify high and low risk tasks: **use the appropriate PPE for the appropriate task (Table 2)** • Train in appropriate and effective PPE use, fit testing or checking depending on PPE type, cleaning and disposal. • Stop at intervals to check PPE is being worn properly (e.g. use a buddy). • Manage any hazards assocated with using PPE (refer to last page).

Table 2: COVID-19 PPE Risk Management Matrix

This table reflects the extent to which different tasks require different PPE. This means implementing the hierarchy of controls (Table 1) in order to ascertain whether PPE is in fact required, and if so, acertaining what PPE to use based on this risk assessment matrix.

Risk Level Definition	Scenario	PPE Required [Note 1, 2]
Extreme likelihood of COVID-19 transmission or exposure	Health Care Workers (HCW) who **are** performing aerosol generating procedureS (AGPs) on COVID-19 patients, including resuscitation [Note 3]	See Table 3. AGPs have been risk stratified with differentiated PPE requirements, based on frequency and duration of use.
High likelihood of COVID-19 transmission or exposure	HCW engaged in aged care, hospital emergency departments and COVID-19 wards, who **are not** performing aerosol generating procedures on COVID-19 patients [Note 3]	• Long-sleeved fluid resistant gown (aprons are a suitable alternative if the risk of splash is low e.g. specimen collection) • Surgical mask (fluid resistant, level 2 or 3) • Eye protection: face shield, wrap-around safety glasses or goggles • Disposable non-sterile gloves when in contact with patient (use hand hygiene before donning and after removing gloves)
Medium likelihood of COVID-19 transmission or exposure	HCW engaged in primary care tasks (including dental practices and the like) that **do** entail face-to-face contact with the general public.	Apron or gown, surgical mask, protective eyewear, gloves (suspected cases only) [Note 1]
	Workers engaged in cleaning duties at health facilities and cluster locations	Apron or gown, surgical mask, protective eyewear, household gloves
Low likelihood of COVID-19 transmission or exposure	Non-HCW engaged in industries that **do** entail less than 1.5 / 2.0 metre [Note 4] contact with the general public, such as hair salons and public transport	Workers may need to wear face masks and gloves, based on the frequency and duration of their general public exposures within 1.5 / 2.0 metres [Note 4]
Insignificant likelihood of COVID-19 transmission or exposure	People working from home, or in workplaces that **do not** entail less than 1.5 / 2.0 metre [Note 4] contact with the general public	PPE usually not required.

Note 1: **In all scenarios, PPE use remains subject to compliance with all other workplace COVID-19 transmission prevention protocols and Government directives, such as mandatory face mask use in situations of high community transmission.**

Note 2: Non-reuseable PPE **must not** be sanitised or otherwise reused. Procedures for sanitising reusable PPE **must** be identified, trained, and followed.

Note 3: Donning and doffing PPE may result in signifcantly slower response times in emergency situations, and extend the time required to perform an otherwise quick procedure. This issue requires active consideration of productivity expectations, capability and staffing levels.

Note 4: Social distancing requirement is 1.5 metres in Australia and 2.0 metres in New Zealand..

Table 3: COVID-19 PPE Risk Management Matrix: Aerosol Generating Procedures (AGPs)

This table reflects the extent to which different AGPs require different PPE. This means implementing the hierarchy of controls (Table 1) in order to ascertain whether AGP PPE is in fact required, and if so, acertaining what AGP PPE should be used.

Extreme Risk Level Frequency	Activities [Note 1]	PPE Training/ Required	Possible PPE depending on task – all options listed
Regular	Regular close exposure to suspected / confirmed cases including AGPs *(eg: care of ventilated patients, actively preferentially performing intermittent high-risk tasks, such as COVID intubation and response team, COVID assessment teams, resuscitation teams)*	P2/N95 mask fit / seal training Other PPE training and practice	• N95 mask [Notes 1, 2] Powered Air Purifying Respirators (PAPR) may be considered for improved comfort and visibility, for HCW who are required to remain in the patient's room for an extended period to perform multiple procedures, e.g. more than one hour) • Eye protection: face shield, wrap-around safety glasses or goggles [Note 1] • Long-sleeved fluid resistant gown [Note 1] (aprons are a suitable alternative if the risk of splash is low e.g. specimen collection) [Note 1] • Disposable non-sterile gloves when in contact with patient [Note 1]
Intermittent	Intermittent close exposure to AGP in suspected / confirmed cases *(eg: ENT, gastroenterological, respiratory, dental, endoscopies, neurosurgery)*	P2/N95 mask fit / seal training Other PPE training and practice	• N95 mask [Notes 1, 2] • Eye protection: face shield, wrap-around safety glasses or goggles [Note 1] • Long-sleeved fluid resistant gown [Note 1] (aprons are a suitable alternative if the risk of splash is low e.g. specimen collection) [Note 1] • Disposable non-sterile gloves when in contact with patient [Note 1]

Note 1: Non-reuseable PPE **must not** be sanitised or otherwise reused. Procedures for sanitising reusable PPE **must** be identified, trained, and followed.

Note 2: Workers who use P2/N95 masks **must** confirm they fit / seal properly each time they are used.

Note 3: PPE exposed to body fluids from an infected person or other infectious materials during use should be considered contaminated and promptly removed, using the relevant PPE donning and doffing procedures[2]

[2] In Australia, please refer to the Department of Health's guidance on *How to fit and remove personal protective equipment in the correct order*.
In Aotearoa New Zealand, please refer to the Ministry of Health's *PPE: How to put it on and remove it safely* poster. .

Hazards associated with the use of PPE for COVID-19

As with all PPE, there can be hazards associated with using PPE to protect against COVID-19. Therefore managers, supervisors and workers should specifically consider the following:

- **Biological.** The PPE being used is intended to either protect the wearer while caring for COVID-19 patients or for protecting at-risk patients from acquiring COVID-19. PPE exposed to body fluids from an infected person or other infectious materials during use should be considered contaminated and promptly removed, using the relevant PPE donning and doffing procedures.[3]
- **Physical.** The most likely physical hazard in the COVID-19 setting will be heat stress (in particular PAPR), for which steps must be taken to ensure adequate temperature control and PPE wearer hydration. If this cannot be achieved, limits should be applied as to how long PPE can be worn.

  Some consideration may also need to be given to considering other physical hazards while wearing COVID-19 PPE, such as cold, noise, vibration and radiation protection.
- **Chemical.** The increased need for handwashing by *all* hospital personnel (not just those wearing PPE), may increase the risk of irritant contact hand dermatitis, especially for personnel using latex gloves.

  Early identification and prevention of such cases is essential, as those with recurrent episodes of irritant contact hand dermatitis may require *permanent* removal from such duties. Personnel with this condition should therefore be removed from *all* duties that entail handwashing (ie not just those entailing PPE) for treatment, and they should not resume such duties until all treatment is completed.
- **Ergonomic:** PPE gloves can reduce manual dexterity (thereby making fine movements more difficult); goggles and face shields can impair vision (thereby increasing the risk of slips/trips/falls among other hazards), and gowns can impair movement (which may create more back injuries, such as while turning patients), and can catch on objects (thereby creating sharps and spill hazards). Performing tasks while wearing PPE is therefore likely to be harder and take longer to perform than otherwise; this will be exacerbated by the increased number of people who are using PPE.
- **Human factors.** Human factors considerations with respect to PPE include:
  - The need to allow additional time for / frequency of food, fluid and toilet breaks.
  - Increased fatigue caused by limitations on the ability to sit, increased weight, impaired movement and need for greater concentration on fine motor and other tasks. This may require rest breaks additional to those required for food, fluids and toileting.
- **Psychosocial.** Psychosocial hazards posed by PPE use include:
  - Accidents and incidents involving PPE failures, which can result in increased risk of infection and may result in acute stress events.
  - Increasing staff fatigue, noting that they may be treating COVID-19 for at least several months, resulting in more treatment errors, interpersonal relationship issues, and greater potential for burnout.
  - Increased communication problems and staff interaction *additional* to those inherent to the current social distancing guidelines, especially for people who live alone, or do not feel well-supported by their co-workers.

Particular attention is therefore drawn to the AFOEM's initiative on the health benefits of good work and its associated resources.

[3] In Australia, please refer to the Department of Health's guidance on *How to fit and remove personal protective equipment in the correct order*
In Aotearoa New Zealand, please refer to the Ministry of Health's *PPE: How to put it on and remove it safely* poster

In addition, PPE use is not only likely to be significantly increased by the greater number of people using it, but also by the aforementioned hazards increasing the amount of PPE being used by each individual. These factors should be considered in managing PPE stocks.

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