

Fit testing of particulate filter respirators in respiratory protection programs

Human Resources Guideline (QH-GDL-401-3-4)

Purpose

The fit testing of particulate filter respirators in respiratory protection programs guideline has been developed to provide guidance and recommendations for decision-makers and workers in a healthcare setting in Queensland Health and Hospital and Health Services. The purpose of the document is to support safe and practical fit testing within respiratory protection programs.

The document aims to:

- Acknowledge the primacy of health, safety, and wellbeing of all workers at work, and all other people who might be affected by exposure to respiratory hazards (i.e. our patients, visitors, and community).
- Highlight the practical considerations for implementation of large-scale fit testing programs (when required).
- Provide guidance on prioritisation following a risk assessment to support optimal allocation of effort and resources.
- Provide guidance on some of the complex issues and risks associated with risk based respiratory protection programs.

The guideline will assist the Queensland healthcare system to embed respiratory protection practices in a business-as-usual approach. The COVID-19 pandemic heightened awareness and prompted stronger responses to respiratory hazards in healthcare settings. Use of respiratory protective equipment (RPE) is applicable to prevent the inhalation of respiratory hazards e.g., aerosol transmissible infectious agents, chemical agents, droplet and aerosol transmissible particles like dusts and microfibers. The principles of fit testing respiratory protection apply to other types of RPE.

Scope

This guidance document provides information for all Queensland Health and Hospital and Health Service (HHS) employees and all organisations and individuals acting as its agents (including visiting medical officers and other partners, contractors, consultants, students, and volunteers).

The information in this guideline may also be applied by other health and care organisations and services such as primary care and residential care. It is intended to inform local policies and procedures and to support local decision-making using a risk management framework. Guidance on general risk and incident management is presented in Queensland Health's *Health, safety and wellbeing risk management standard* (QH-IMP 401-3) and the supporting *Health, safety and wellbeing risk management guideline* (QH-GDL-401-3-1).

The scope of this guideline is focused on air-purifying respirators and is principally focused on disposable particulate filter respirators (PFR) also known as a P2 or N95 mask.

Relevant legislation, standards, and guidance

This guideline should be read in conjunction with the following:

<p>Work Health and Safety Act 2011 (Qld)</p> <p>(https://www.legislation.qld.gov.au/browse/inforce)</p>	<p>Provides a framework to protect the health, safety and welfare of all workers at work and of all other people who might be affected by the work. Workers and other persons at the workplace (including patients, visitors etc.) must also take reasonable care for their own health and safety; and care that their conducts, acts or omissions does not adversely affect the health and safety of others.</p>
<p>Work Health and Safety Regulation 2011 (Qld)</p> <p>(https://www.legislation.qld.gov.au/browse/inforce)</p>	<p>Division 5, Section 44 (3) of the Regulation describes how to prevent or minimise risk at the workplace and includes provisions specifically regarding PPE suitability, size, fit, maintenance, hygiene, and use.</p>
<p>Australian Standards / New Zealand Standards</p>	<p>AS/NZS 1715:2009 - Selection, use and maintenance of respiratory protective equipment.</p> <p>AS/NZS 1716:2012 - Respiratory protective devices.</p> <p>AS/NZS 4381:2015 - Single-use face masks for use in healthcare.</p> <p>AS/NZS 2243.3 – Safety in Laboratories.</p> <p>Relevant AS/NZS are planned to be superseded following transition to ISO allowing a 5-year period from ISO adoption in 2023.</p> <p>AS/NZS TS ISO 16975.1:2023 Respiratory protective devices, Selection use and maintenance - Part 1 establishing and implementing a respiratory protective device program.</p> <p>AS/NZS ISO TS 16975.2:2023 Respiratory protective devices – Selection, use and maintenance – Part 2: Condensed guidance to establishing and implementing a respiratory protective device program.</p> <p>AS/NZS ISO 16975.3:2023 Respiratory protective devices, selection use and maintenance- Part 3 Fit testing procedures Identical adoption of ISO 16975-3 2017.</p> <p>AS/NZS ISO TS 16975.4:2022 Respiratory protective devices Selection, use and maintenance Part 4: Selection and usage guideline for respiratory protective devices under pandemic/epidemic/outbreak of infectious respiratory disease.</p>

<p>Australian Guidelines for the Prevention & Control of Infection in Healthcare (2019)</p> <p>(https://www.nhmrc.gov.au/about-us/publications/australian-guidelines-prevention-and-control-infection-healthcare-2019)</p>	<p>The benefits of wearing a correctly fitted P2 respirator when an airborne transmissible agent is known or suspected clearly outweighs any undesirable effects. This practice would require the provision of P2 respirators and fit testing of respirators to the healthcare staff.</p>
<p>National Safety and Quality Health Service Standards</p>	<p>The Preventing and Controlling Infections Standard requires that leaders of health service organisations develop, implement, and monitor systems to prevent, manage and control infections.</p> <p>(https://www.safetyandquality.gov.au/standards/nsqhs-standards/preventing-and-controlling-infections-standard)</p>
<p>Workplace exposure standards for airborne contaminants (Safe Work Australia)</p> <p>(https://www.safeworkaustralia.gov.au/doc/workplace-exposure-standards-airborne-contaminants-2024)</p>	<p>This document contains a list of workplace exposure standards for airborne contaminants (exposure standards) and how to meet duties under the Work Health and Safety (WHS) Act and the WHS Regulations. Note: transitional until 01 December 2026 when workplace exposure limits (WEL) will replace the current WES.</p>
<p>Health, safety and wellbeing risk management Standard (QH-IMP-401-3)</p> <p>Health, safety and wellbeing risk management guideline (QH-GDL-401-3-1)</p> <p>(https://www.health.qld.gov.au/system-governance/policies-standards/doh-policy)</p>	<p>The Queensland Health Standard establishes the requirements for managing work health and safety (WHS) hazards and risks. The associated guideline provides detailed information on how this standard can be met.</p>
<p>Acute Respiratory Infection– Infection Prevention and Control (Queensland Health)</p> <p>(https://www.health.qld.gov.au/__data/assets/pdf_file/0025/1246228/acute-respiratory-infection.pdf)</p>	<p>Version 2.3 5 Jan 2024 Appendix 4 Recommended approach to assessing close contact exposures to COVID 19 in the hospital setting for recommended actions for staff exposed to or with COVID-19.</p>

<p>Guidance on the use of personal protective equipment (PPE) for health care workers in the context of COVID-19</p> <p>(https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-for-health-care-workers-in-the-context-of-covid-19)</p>	<p>This guidance, produced by the Infection Control Expert Group of the Australian Health Principal Protection Committee (October 2022), includes general considerations on the use of masks and respirators and recommendations for their use in the context of COVID-19.</p>
<p>Queensland Health policy position statement v0.4</p>	<p><i>Facial hair and ensuring the adequate performance of respiratory protective equipment.</i></p> <p>(https://www.health.qld.gov.au/__data/assets/pdf_file/0011/1170020/respiratory-protection-workers-with-facial-hair.pdf)</p>
<p>Worker Definition as per section 7 of the <i>WHS Act 2011</i> (Qld)</p>	<p>A person is a worker if the person carries out work in any capacity for a person conducting a business or undertaking including work as—</p> <ul style="list-style-type: none"> (a) an employee; or (b) a contractor or subcontractor; or (c) an employee of a contractor or subcontractor; or (d) an employee of a labour hire company who has been assigned to work in the person’s business or undertaking; or (e) an outworker; or (f) an apprentice or trainee; or (g) a student gaining work experience; or (h) a volunteer; or (i) a person of a prescribed class. <p>The person conducting the business or undertaking is also a worker if the person is an individual who carries out work in that business or undertaking.</p>

Certified agreement obligations

The following certified agreements require that Queensland Health comply with this guideline (or replacement document/s):

Medical Officers’ (Queensland Health) Certified Agreement (No.6) 2022 (MOCA6) clause 5.13.3:

Queensland Health will comply with all legislative requirements, including the *Work Health Safety Act 2011*, the COVID-19 Infection Prevention and Control Manual for acute and non-acute healthcare settings (or replacement document/s, and the Managing Healthcare Workers Exposed to or with COVID-19 Procedure (or replacement document/s),), and Fit Testing of particulate filter respirators in respiratory protection programs Implementation Guidance (or replacement document/s) as they relate to respiratory protective equipment requirements

Visiting Medical Officers' Employees (Queensland Health) Certified Agreement (No. 1) 2023

clause 5.5.3: Queensland Health and Visiting Medical Officer Employees will comply with all legislative requirements, including the *Work Health Safety Act 2011*, (or replacement document/s), Interim: Acute Respiratory Infection – Infection Prevention and Control (or replacement document/s), and Fit Testing of particulate filter respirators in respiratory protection programs Implementation Guidance (or replacement document/s) as they relate to respiratory protective equipment requirements.

Background

Respiratory protection is required for pathogenic microorganisms that are usually transmitted via the droplet or airborne route, or when airborne particles have been artificially created, such as during aerosol generating procedures, hazardous drug handling, dust, and chemical hazards. Refer to Chemical Hazards Risk Factors - Healthcare Workers (CDC) (<https://www.cdc.gov/niosh/healthcare/risk-factors/chemical-hazards.html>) for further information about chemical hazards.

When considering the hierarchy of controls (Figure 1 provides a graphical representation) in mitigating workplace risks, the use of personal protective equipment (PPE) is the lowest level of control and the least effective. However, where it is not possible to eliminate the risk of exposure to infectious agents in healthcare, the use of PPE for respiratory protection should be considered as an essential element of defence in the hierarchy of infection prevention measures; refer to Figure 1. In addition, controls from other levels in the hierarchy should be used concurrently to reduce and control the risk to employees, patients, and others.

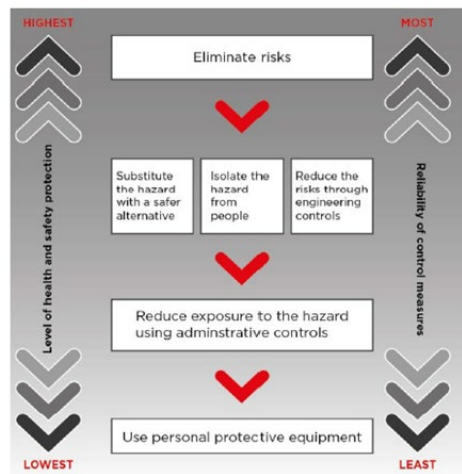


Figure 1. Hierarchy of controls. Source: *How to manage work health and safety risks, Code of Practice, 2021 Workplace Health and Safety Queensland*

Where respiratory protective equipment is required, Australian Standard/New Zealand Standard 1715:2009 Selection, use and maintenance of respiratory protective equipment (AS/NZS 1715:2009) and AS/NZS ISO 1675.1 Establishing and implementing a respiratory protective device program requires that a respiratory protection program be established. It is important to recognise that fit testing is only one component of a respiratory protection program. The section on [Elements of a respiratory protection program](#) elaborates on this.

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Development and implementation of a broad Respiratory Protection Procedure within local HHS Safety Management Systems will support delivery of an effective respiratory protection program.

For further information on the hierarchy of controls in the context of respiratory disease transmission refer to the Australian Government Department of Health *Minimising the risk of infectious respiratory disease transmission in the context of COVID-19: the hierarchy of controls* (<https://www.health.gov.au/resources/publications/the-hierarchy-of-controls-for-minimising-the-risk-of-covid-19-transmission>).

The diagram at Figure 1 illustrates how fit testing augments respiratory protection and expands levels of control by:

- ensuring the Respiratory Protective Equipment (RPE) i.e. P2/N95 respirators, worn is suitable by design, and ensures adequate respirator seal, and
- enabling instruction and training on correct use.

Risk assessment and management

Processes must be in place to recognise and manage the risk to workers in a healthcare setting of exposure to respiratory pathogens and other respiratory hazards in alignment to local risk management practices. Where respiratory protection is required then a respiratory protective program must be implemented.

The risk management plan should include:

1. Identification of risk – which respiratory pathogens may be in the workplace, and situations where risk may be increased (for example an intensive care unit with aerosol generating procedures).
2. Assess the risk – which workers in healthcare settings are exposed to the risk, and in which situations.
3. Treat the risk – utilise measures within the hierarchy of control.
4. Document and report following local procedures.
5. Monitor and review – changes in levels of exposure risk may drive an escalation or de-escalation of risk treatments. Periodic review is suggested annually and at other times when the risk of exposure change.

Example risk treatments

Elimination: workers in healthcare settings exclusion from work if unwell, health screening, review work practices by restricting entry into an isolation room.

Substitution: physical distancing, work from home, telehealth, hospital in the home, patient assessment at point of entry to facility, to determine requirement for transmission-based precautions.

Engineering: negative pressure isolation rooms, single room with ensuite, air purifiers/cleaners.

Administrative: vaccination, HVAC assessment of air change factors¹, transmission-based precautions, standard precautions, hand hygiene compliance, cleaning and disinfection, information (signs/posters/FAQs).

Personal Protective Equipment: appropriate level of PPE to assessed risk, fit testing, and fit checking PFR.

Hospital and Health Service responsibilities

Hospital and Health Services (HHSs) are responsible for implementing the elements of a respiratory protection program in accordance with AS/NZS 1715:2009 and AS/NZS ISO 16975.3:2023 and any local respiratory protection procedures. HHSs are required to prioritise workers in a healthcare setting access to fit testing based on assessed levels of risk using a risk assessment and management approach. Employers are responsible for providing a safe work environment as per the *Work Health and Safety Act 2011 (Qld)*. The health and safety regulator Workplace Health and Safety Queensland (WHSQ) may take enforcement action where tight-fitting respirators are provided to workers without instruction, training in the correct use and/or fit testing. As per the *Health, safety and wellbeing consultation HR Guideline (QH-GDL-401-2)*, responsible officers within accountable areas must ensure that consultation is undertaken on all aspects of a respiratory protection program development and delivery.

¹ Optimising ventilation for infection prevention and control in healthcare settings Australian Commission on Safety and Quality in Health Care 2022 (<https://www.safetyandquality.gov.au/publications-and-resources/resource-library/optimising-ventilation-infection-prevention-and-control-healthcare-settings>)

Elements of a respiratory protection program

Respiratory protection programs include several elements that are designed to protect workers from workplace respiratory hazards including airborne infectious agents, dust, and other particles. A respiratory protection program includes the following components from AS/NZS 1715:2009 - Selection, use and maintenance of respiratory protective equipment:

- Appointment of a program administrator
- Selection of respiratory protection equipment and fit testing equipment
- Medical screening of users to ensure suitability for wearing RPE
- Training
- Issue of respiratory protection equipment
- Fitting of respiratory protection equipment
- Wearing of respiratory protection equipment
- Maintenance of respiratory protection equipment (not relevant to P2/N95)
- Disposal of equipment (not relevant to P2/N95)
- Troubleshooting issues related to any of the respiratory protection equipment program (i.e., fit testing equipment, mask supplies, safety alerts)
- Record keeping
- Program evaluation

The focus of this document is fit testing and fitting of RPE, guidance is also provided on some of the other elements of a respiratory protection program. Elements touched on in this guidance document are **underlined** in the above list. For further guidance on the elements of a respiratory protection program refer to AS/NZS 1715:2009 - Selection, use and maintenance of respiratory protective equipment and AS/NZS ISO 16975.3:2023 - Respiratory protective devices, selection, use and maintenance – Part 3 - Fit testing procedures.

Program administrator and other required roles

Respiratory Protection Program Administrator

An individual must be assigned the responsibility to lead the respiratory protection program for the HHS. The program administrator should be a work health and safety professional or have an understanding of the key principles of respiratory protection and of workplace hazards and risks. This administrator will require the support of work health and safety, executive, infection prevention and control, infectious diseases, patient flow and other relevant skillsets in order to design and administer an effective RPP.

Key functions of the role (not intended to be exhaustive)

- Development of procedures for all elements of the respiratory protection program, including fit testing and training.
- Establishment of model of training for those performing fit testing; for example, train-the-trainer model
- Ensure dissemination of Respiratory Protection Program updates and information to all fit testers and necessary stakeholders (for example, changes to masks provided, safety alerts, fit testing system or program updates).

Respiratory Protective Device (RPD) Programme administrator: The programme administrator shall be responsible for effective management of the entire respiratory protection program. It is open for Hospital and Health Services to utilise either ISO 16975 or AS/NZS1715:2009 descriptors of the role of Program Administrator. For further information on AS/NZ1715:2009 RPP Administrator role see Section 2.3 of *NSW Clinical Excellence Commission Respiratory Protection Program* (<https://www.cec.health.nsw.gov.au/keep-patients-safe/infection-prevention-and-control/COVID-19/respiratory-protection-program>).

Fit testing provider and trainer

Fit testing should be undertaken by a competent person. Refer to ISO 16975-3 Section 5 and Annex A, Competent fit-test operator. Note that ISO 16975 -1 Section 6.3 Roles and responsibilities. 6.3.1 General: All persons involved in the respiratory protection programme shall be competent in their area of responsibility within the RPD programme and maintain the appropriate knowledge, experience and training to effectively carry out their duties.

Selection of PFRs

Only PFRs (disposable and non-disposable) that meet the requirements of AS/NZS 1716:2012 or the equivalent international standard and are included in the Australian Register of Therapeutic Goods (ARTG) should be used in healthcare clinical settings and considered in respiratory protection programs.

It is also important to ensure that the PFRs used in the fit testing programs are those which will continue to be available to workers in healthcare settings at the point of use. Each worker in a healthcare setting assessed as requiring to be fit tested, shall be tested to a pass result for two or more respirators, to enable alternatives in case of supply shortages. Some disposable respirators are not adequately fluid-resistant and should not be used when high-velocity splashes of blood or body fluid are likely unless used in combination with a full-face shield to provide splash protection.

Note: workers outside of clinical settings, such as engineering and maintenance workers, are not restricted to ARTG listed respiratory protection. Other PFRs and RPD may be used relative to the assessed hazard exposure, examples such as dust, asbestos and chemicals where clinical respirators are not suitable.

Training

The training required as part of a respiratory protection program is:

- Training in carrying out fit testing (for the fit testers),
- Training in principles of disease transmission and other respiratory hazards,
- Training in the appropriate use of respiratory protection equipment, including:
 - When to use and use in accordance with manufacturer's advice and instructions,
 - Safe fitting and removal (donning and doffing) including corrective actions when fitting or removal compromises safety of the user or other workers,
 - Fit checking,
 - Appropriate disposal of single use equipment,
 - Reprocessing of reusable equipment,
 - Routine maintenance and checks of reusable PFRs and fit testing equipment,
 - Troubleshooting issues with fit testing equipment,
 - Competency assessment.

Fit Testing

Timing of fit testing

In accordance with AS/NZS 1715:2009, AS/NZS ISO 16975.3:2023 and the Australian Guidelines for the Prevention and Control of Infection in Healthcare

(<https://www.safetyandquality.gov.au/publications-and-resources/resource-library/australian-guidelines-prevention-and-control-infection-healthcare>), fit testing of PFRs must be undertaken:

- at the commencement of employment and annually for those who will be working in environments where significant risk of exposure to infectious agents transmitted via the airborne route, and/or other respiratory hazards has been identified and assessed.
 - Clinical areas where staff are expected to wear a PFR for the management of pathogens transmitted by the airborne route or have potential to become airborne during aerosol producing procedures, for example respiratory, infectious diseases, emergency, TB services, intensive care and medical imaging.
 - Other clinical and non-clinical areas as identified through a local risk assessment by workplace health and safety and infection prevention and control staff.
- When there is a significant change in the wearer's facial characteristics that could alter the facial seal of the respirator (e.g. significant change in body weight, facial surgery, or growth in facial hair).
- When a new brand or model of PFR is required to be used.
- Thereafter, at regular intervals in accordance with relevant standards — i.e. AS NZS 1715:2009 and AS/NZS ISO 16975.3:2023 both recommend annual fit testing.

Identification of staff for whom fit testing is required

Workers in healthcare settings that are identified as performing activities requiring respiratory protection and/or working in areas with a significant risk of exposure to diseases transmitted via the airborne route or handling other respiratory hazards such as hazardous drugs or other hazardous materials. These workers in healthcare settings must be fit tested and trained in the appropriate use of respiratory protective equipment.

Health Services will monitor and review workers in healthcare settings regarding the requirement to access PFR fit testing. The requirement following risk assessment is to be documented using a risk management framework. This requirement is contingent on escalating and de-escalating requirements related to identified roles. For example: where staff are redeployed to higher risk areas. Risk assessments, however, may indicate a worker in a healthcare setting that is no longer required to use a PFR and therefore fit testing will not be required to be repeated.

Fit Checking

Fit checking or user seal check is a process to ensure that the respirator fits the wearer's face snugly (i.e., creates a seal) to minimise the number of particles that bypass the filter through gaps between the wearer's skin and the respirator. The respirator must be put on (donned) and taken off (doffed) correctly and worn throughout the exposure. The fit testing program can only be implemented if a fit checking process is already in place.

Considerations for fit checking²:

- Fit checking is a process used for all tight-fitting respirators (e.g., P2/N95 respirators) regardless of whether fit testing is conducted.
- Fit checking at the time of use is the most reliable method of ensuring the HW has achieved an optimal fit and required seal in real time.
- All workers in healthcare settings who are required to wear a P2/N95 respirator must have undertaken education on the importance of fit checking and know how to fit check.
- Use a secondary person to assist assessment of fit check (buddy or colleague) or a mirror where possible.

Workers in healthcare settings are to perform a fit check each time a respirator is donned to check that a good facial seal is achieved i.e., the respirator is sealed over the bridge of the nose and mouth and there are no gaps between the respirator and the face. Always refer to the manufacturer's instructions for use (IFU) for fit checking of individual brands and types of P2/N95 respirators as the method may vary depending on the brand and model of the respirator.

² Adapted from the NSW Health document Respiratory Protection Program Manual Version 2.0 – November 2023 Page 12 of 145.

See Principles of fit check for P2/N95 respirator (poster – Queensland Health) (https://www.health.qld.gov.au/__data/assets/pdf_file/0035/974294/p2-n95-fit-check.pdf).

The workers in a healthcare setting must not have any facial hair present under the sealing surface of the respirator as a fit cannot be achieved if facial hair is present. Workers who are unable to remove facial hair due to medical reasons, cultural or religious observance cannot safely wear a P2/N95 respirators as a fit cannot be achieved. Alternative duties will need to be considered in instances such as these.

Activities requiring respiratory protection in healthcare:

Routine care of, or contact with, patients with infections considered to be transmitted, or have the potential to be transmitted via the airborne route. Further information is available at <https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/diseases-infection/infection-prevention/transmission-precautions>. Workers in a healthcare settings performing aerosol generating procedures (AGPs) in patients with infections that are transmitted by the droplet route (including COVID-19).

Some common examples of AGPs are below:

- instrumentation or surgical procedures on the respiratory tract e.g. intubation, bronchoscopy, tracheostomy, disconnection of closed ventilator circuit, nebuliser treatment, ear, nose, and throat, maxillofacial/transsphenoidal or thoracic surgery involving the lung,
- non-invasive ventilation, induced sputum collection, high-flow nasal oxygen,
- handling other respiratory hazards such as hazardous drugs or other hazardous materials,
- dentistry AGP procedures that use any of the following devices: high speed hand pieces, surgical hand pieces, ultrasonic and sonic devices, air polishing devices, and lasers. Triplex where air and water are used together can be considered aerosol generating.

Potential aerosol-generating procedures (AGPs)³

- Intubation/extubation
- Cardiopulmonary resuscitation
- Tracheostomy
- Ventilation, including non-invasive and manual ventilation
- Bronchoscopy
- Airway suctioning
- Oxygen administration
- Nebulised medication

High risk areas include:

- Emergency Departments
- Intensive Care Units (ICU), Paediatric/Neonatal Units
- Wards with negative pressure rooms or respiratory isolation rooms
- Bronchoscopy Units
- Operating rooms or procedural rooms where bronchoscopy or other aerosol generating procedures are performed.
- Ambulance (pre-hospital setting)
- Any other work area / clinical / environmental circumstances identified as high risk for worker exposure based on local risk assessment.

High risk workers in healthcare settings are defined as:

- Workers in healthcare settings such as clinicians who work in high-risk areas, e.g. nurses, midwives, doctors, allied health, administrative officers.
- Emergency and first responders e.g. Medical Emergency Team, paramedics and any other staff identified as being at high risk of exposure due to the nature of the role.
- Clinical support and ancillary staff, e.g. cleaners, who are required to enter a negative pressure room.
- Workers in healthcare settings who handle hazardous drugs or other hazardous substances.

Other workers should be fit tested based on a risk assessment of the likelihood of caring for patients or having to enter the room of a patient with a known or suspected high morbidity/mortality airborne or respiratory infection (See Appendix 3 - Example Risk Assessment).

³ Healthcare-associated Infections in Australia. Editor Ramon Z. Shaban. ClinicalKey
(<https://www.clinicalkey.com.au/#!/browse/book/3-s2.0-C20190035315>)

For those workers required to wear a PFR, fit testing should be undertaken:

Prior to working in a high-risk area, when there is a significant change in the wearer’s facial characteristics that could alter the facial seal of the respirator (e.g. facial surgery or significant change in body weight), when failing to demonstrate a proper fit check at annual competency assessment.

Priority	Category	Priority Areas
1	High risk workers as stated above. Staff providing direct care to patients in airborne precautions or are required to assist in care, including AGPs. Diseases requiring airborne precautions e.g., Tuberculosis, Measles, Varicella, COVID-19 or emerging pathogens and any other diseases for which public health guidelines recommend airborne precautions.	Anaesthetics Resuscitation / Intubation teams Critical care Infectious diseases Respiratory Emergency departments Ambulance pre-hospital setting Oral Health Other areas as identified by local risk assessment.
2	Other patient care areas BEMS maintenance and other staff who may be exposed to inhalation of dangerous airborne particulates and gases in the course of their work.	Any other area / situation identified as high risk for airborne transmissible disease exposure. Compound Pharmacy Oncology haematology

Type of fit testing to be undertaken

Quantitative (objective) fit test (QNFT)

A quantitative fit test gives objective numerical results using specialised particle counting equipment (such as a PortaCount™ Plus machine). It measures how much air leaks into the wearer’s breathing zone. It does not rely on the subject’s response to a test agent. A quantitative fit test result is superior to a qualitative fit test result because of the objective nature of the test. Quantitative fit testing should be used over qualitative fit testing where a risk assessment indicates the worker will be exposed to the airborne pathogens in the healthcare environment regularly and or for extended durations. Quantitative testing should be used in preference, however qualitative testing is acceptable in circumstances addressing availability and access.

Qualitative (subjective) fit test (QLFT)

A qualitative fit test is a facial fit testing giving pass or fail results and relies on the wearer's subjective response to an aerosolised test agent. A flavoured test agent such as saccharin or Bittrex™ (a bitter tasting substance) is used at a level at which the user will be able to sense its presence within the respirator by taste, smell or the urge to cough if the fit is not adequate. In deciding whether to use qualitative fit testing an assessment should be made of the risk of the subject being unable to detect the test agent due to unanticipated illness (e.g., loss of taste/smell is a symptom of COVID-19). The risks of cross-infection associated with reuse and reprocessing of the testing hood should also be assessed.

Fit Test Exercises: source AS/NZS ISO 16975.3:2023

The wearer shall perform exercises in the following manner:

- a) Normal breathing. In a normal standing position, without talking the subject shall breathe normally.
- b) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution not to hyperventilate.
- c) Turning head side to side. Standing or sitting, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side. Exhalation shall take place through the return movement of the head.
- d) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up and down positions. Exhalation shall take place through the return movement of the head.
- e) Talking. The subject shall talk slowly and loud enough so as to be heard clearly by the fit-test operator. The subject can read from a prepared text, count backwards from 100 or recite a memorised poem.
- f) Bending over. The wearer shall bend at the waist as if to touch their toes and return to an upright position. This shall be repeated. Jogging in place can be substituted for this exercise when using test equipment, such as the shroud type QNLF or QLFT units, that do not permit being at the waist.
- g) Normal breathing, Same as exercise a).

Note: Each fit-test exercise shall be performed for at least 60 seconds. For QNFT, the test exercise should allow for an in-mask sample period of at least 60 seconds. Instruct the person being tested to perform each exercise described above for the entire period. The RPD (PFR) shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test shall be repeated. Note variation in test duration from the Australian Standard to the OSHS 1910.134 (US) shortened protocols endorsed by WorkSafe Qld, Safety Alert 17/12/2021.

Record-keeping

A record of all fit testing conducted by Queensland Health and HHSs must be kept and stored in a secure database that is accessible to authorised persons only. Fit test data must be provided to (or maintained directly in, where applicable), using the Queensland Health Fit Test Register (FiTR) or the enterprise application Queensland Health Mask Helper. Hospital and Health Services are strongly encouraged to transition to the use of MaskHelper as the preferred record keeping method. Records are to be retained as per the Queensland Government General Retention and Disposal Schedule (GRDS).

In addition, workplaces shall maintain a record (e.g., in RiskMan) of any instances where workers have continued to work in situations where a P2/N95 respirator was required but where the respirators were not available, or a fit test was not undertaken or successful. The reporting of these instances should be monitored to ascertain compliance with relevant standards and legislation and to better monitor worker safety in working in environments where risk of exposure to significant known or notable and unusual infectious agents exists.

Fit-test records: source AS/NZS ISO 16975.3:2023

The programme administrator shall ensure that fit-test records are retained and contain the following information:

- a) date of the test;
- b) identification of the fit-test operator and fit-test operator's employer/company name;
- c) name of the person fit tested;
- d) details which will uniquely identify the RI such as make, model, size and material;
- e) details which will uniquely identify all other potentially interfering PPE worn during the fit test such as spectacles, jewellery, make, model and size;
- f) fit-test method used;
- g) pass/fail criteria;
- h) results: pass/fail, fit factors or other information generated may be documented;
- i) corrective actions in case of a failed fit test;
- j) overall fit factor achieved;
- k) pass level used in the test;
- l) serial number or other means of identifying test equipment used in the test;
- m) any additional information the RPD programme administrator deems pertinent.

Communication of results of fit testing

Workers in healthcare settings and their line managers should be advised of the size and brand of respirators that were successfully fitted and be provided with the relevant documentation for future reference. Workers in a healthcare setting should be advised of criteria for further fit testing (recommended annually or sooner if there is a significant change in facial features). Workplaces should implement methods for collection of aggregate fit test results in order to inform procurement. Workers should be advised that their fit testing results will be used for this purpose.

Considerations on common fit testing issues

Facial hair

An adequate seal may be difficult to achieve for people with facial hair. The effectiveness of a tight-fitting facepiece, such as half-face or full-face respirators that use straps, relies on an effective seal with the wearer's face. If the respirator does not fit properly, the wearer will not get the expected level of protection. Facial hair that lies along the sealing surface of a tight-fitting respirator prevents an effective seal. Therefore, it is a requirement that there is no hair growth between the skin and the facepiece sealing surface to achieve a fit. Staff must be advised that this requirement continues for use of respirators in practice, not only for the fit testing process.

AS/NZS ISO 16975.3:2023 provides guidance regarding facial hair and other interference concerns (section 6.3):

6.3.1 Facial hair

Skin contacting respiratory interface sealing surfaces shall be shaved within 24 h of testing, preferably within 12 h.

A person shall not be fit tested if:

- a) hair comes between the sealing surface of the RI (Respiratory Interface) and the face or neck; or*
- b) hair interferes with valves and/or RPD function.*

Other factors that may interfere with facial seal include jewellery, facial makeup, gels and creams: When any PPE and/or RPD accessory has the potential to interfere with the seal, it shall be worn during the fit test to ascertain compatibility with the RPD.

Pressure injuries from tight-fitting respirator use

Wearing of respirators may lead to unintended facial injuries, it is important for workers in healthcare settings to ensure consideration of the following:

- Limit respirator use to only when necessary.
- Hydrate by drinking plenty of fluids.
- Avoid wearing makeup.
- Use a mild skin cleanser and avoid products that are irritating to the skin.
- Use a moisturiser on a regular basis.
- Seek medical assistance if you develop irritated skin and avoid using products that exacerbate any skin sensitivity.

Workers should report any issues with pressure injuries to their line manager, submit a RiskMan for worker injury, and health and safety representative (HSR) for management. Further guidance regarding facial injury from RPE is available – see https://www.health.qld.gov.au/__data/assets/pdf_file/0030/1139943/facial-injury-rpe-guideline.pdf.

Fit testing of particulate filter respirators in respiratory protection programs - Human Resources Guideline (QH-GDL-401-3-4) – Chief Human Resources Officer – 10 October 2024

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Staff unable to comply with respiratory protection requirements

The requirement for use of PPE and to remove facial hair as necessary is a lawful direction in accordance with the Queensland Work Health and Safety Legislation and as per the specific requirements in AS/NZS 1715:2009. Employees can seek an exemption from a lawful direction for certain prescribed reasons (such as medical, cultural and religious reasons). Where a circumstance of non-compliance arises, the following broad steps are recommended in reaching a resolution: consulting with workers in healthcare settings, explaining risks of inadequate protection from a respirator, exploring different options (such as another work location, remote or flexible work) and the potential to take leave.

Please discuss local issues regarding any workers that decline to remove their facial hair with the local Human Resources department/unit, and consult the Queensland Health position statement: *Facial hair and ensuring the adequate performance of respiratory protective equipment*

(https://www.health.qld.gov.au/__data/assets/pdf_file/0011/1170020/respiratory-protection-workers-with-facial-hair.pdf).

Failing fit test

Workers in healthcare settings who fail a fit test with a respirator must be tested with alternative respirators to ensure the correct brand and size is determined in relation to facial features to enable the ability to maintain a facial seal. Where repeated fit test has failed, workers in healthcare settings must be referred to the Fit Testing Program Administrator in consultation with their line manager for re-evaluation and development of a plan. Fit testing for a powered air-purifying respirator (PAPR) may also be considered. This should only be considered after failing fit test with disposable respirators, due to the risk of contamination during removal of PAPR. Careful attention must be paid to correct fitting and removal processes, as well as cleaning and disinfection. Refer to Queensland Health *Guideline for CleanSpace HALO Powered Air Purifying Respirator (PAPR)*

(https://www.health.qld.gov.au/__data/assets/pdf_file/0023/1066217/guideline-cleanspace-halo.pdf). Fit testing should be conducted if a fit tested PFR becomes unavailable with alternatives. If a new PFR of different specifications becomes available, repeat testing may be considered.

Medical evaluation

There is the potential for PFRs to cause physical and psychological stress on users. Where an individual worker in a healthcare setting identifies as having a condition which may be impacted by the use of a PFR, they should be assessed to determine whether it is safe for them use to a PFR.

Physiological considerations include whether they have any cardiac or respiratory conditions especially for prolonged use or heavy work. Psychological considerations include claustrophobia, anxiety or isolation. Information and training and therapeutic psychological interventions can be given to help users overcome these concerns.

ISO AS/NZS16975:2 Annex A Medical conditions.

Some pre-existing conditions (examples include breathing disorders such as asthma, or skin allergies or heart problems) may restrict or prevent some workers wearing any RPD or certain types of RPD. Ensure that workers are medically able to wear the selected and required RPD. Seek medical advice. Where national or local regulations exist, these should be followed.

Healthcare organisations should perform screening of workers in healthcare settings physiological and psychological considerations by self-declaration on fit testing booking systems. Best practice for fit testers, is to identify by reviewing potential considerations that may impact users of RPE prior to commencing fit testing.

Risk assessment for staged fit testing

When healthcare demand is extreme, full and immediate implementation of fit testing for every worker in a healthcare setting assessed as requiring a PFR may add strain on human resources and supply of PFRs. Refer to the Acute Respiratory Infection – Infection Prevention and Control, guidance regarding PPE escalation specific to PFR recommendation (https://www.health.qld.gov.au/__data/assets/pdf_file/0025/1246228/acute-respiratory-infection.pdf).

Healthcare organisations should perform and document a timely risk assessment to determine whether full implementation of fit testing is reasonably practicable. A risk stratified approach, with prioritised fit testing directed towards the locally identified highest risk situations, done in consultation with workers in healthcare settings, is an appropriate way to manage limited resources and the required implementation of RPE controls. Consultation with unions should be undertaken on the application of risk assessments that determine staged fit testing implementation.

Fit testing must occur in line with the AS/NZS 175:2009 and AS/NZS ISO 16975.3:2023.

Decisions regarding staged implementation of fit testing should:

- Be focussed on practical risk reduction.
- Prioritise those staff who are assessed as at being of greatest risk of exposure.
- Address both physical and psychological safety.
- Provide for transitional measures for staff who are working in high-risk environments, but who have not yet been able to be fit tested, subject to operational requirements.

In identifying those workers in a healthcare setting at highest risk of infection from airborne transmission, factors that may increase the risk of transmission can be considered. These factors include:

- process factors
- cumulative exposure to the patient and infectious agent i.e., prolonged or repeated contact
- multiple infected patients in an enclosed space
- encounters with patients before their risk can be assessed (e.g., in emergency departments, particularly prior to triage)
- care settings that are less controlled (e.g., pre-hospital environment, in-home care or outreach services).

Patient factors:

- aerosol-generating behaviours likely (such as coughing, shouting, screaming, increased work of breathing)
- inability to cooperate/cognitive impairment, inability to tolerate a surgical mask, challenging behaviours
- exposure during period of high infectivity.

Environment factors:

- suboptimal ventilation
- unexpected air movements (opening doors, fans, foot traffic)
- enclosed space.

Fit testing of agency staff, contractors and students

Records of agency staff, contractors, and students fit testing results are to be made available to Queensland Health as required. Validation of the ability to perform competent fit checking for the type of PFR may be requested at any time (real time fit check).

Evidence of fit test outcome may be provided from either a Hospital and Health Service, an outsourced company, or on official education provider letterhead if the testing was conducted internally. Records of agency staff, contractors, and students fit testing results are to be made available to Queensland Health as required and are to contain the following details:

- Name of fit tester
- Fit testing organisation name and contact details
- Name of agency staff/contractor/student and identification number
- Date of fit test (within 12 months)
- Medical screening / evaluation of physical and psychological capacity to use RPE
- Make/brand, model, and size of two RPE successfully fitted (including manufacturers reference number)
- Fit factor/s

- Real time fit check
- If a qualitative or quantitative test was performed.

Fit testing must be conducted in accordance with Australian/New Zealand Standard 1715:2009 and AS/NZS ISO 16975.3:2023. Data retention requirements of fit testing under the Student Deed is for 25 years.

Students

Students attending clinical placements in Queensland Health and HHS facilities may be required to wear fit-tested respirators during their placement.

The requirement to use a PFR relates to the risk of infection with an airborne transmitted disease or other respiratory hazard. Some students already routinely wear appropriately fit tested respirators while on clinical placement, due to the locations they are attending and the patients they are seeing. Queensland Health requires education providers to continue to ensure their students are appropriately fit-tested, and trained in safe use of PPE, and have an understanding of principles of aerosol disease transmission prior to commencing placement where it is required. Education providers should make arrangements to support timely fit testing of their student cohorts (or individual students, as the case may be) where it is required.

To support student placements within Queensland Health and HHS facilities, education providers should contact respective Queensland Health hospital and health services to determine likely type and brand of respirator utilised within the HHS. Education providers are able to purchase PFRs from Supply Chain Services of the make/model and size utilised in Queensland Health and HHSs, for further information contact: accountmanagementscb@health.qld.gov.au.

Students who do not produce records of fit testing results, where respirators are required, may not be able to proceed with placement. A HHS may decide to fit test a student in certain circumstances (e.g. where the student has a fit test result for a PFR that is not available). A HHS may decide to deploy a student to another area not requiring the use of a PFR and a fit test.

Agency staff and Contractors

Under Standing Offer Arrangement (SOA) HSQ84282 Nursing and Midwifery Services (10.4.2), guidance on the responsibility of the supplier (agency) to ensure fit testing is stated as follows: *The Supplier warrants that they understand their obligations under all applicable workplace relations, occupational health and safety and workers' compensation laws and regulations. The Supplier undertakes to comply with all relevant legislation and assumes the relevant obligations as an employer of the Candidate, and to be responsible for all payroll, superannuation, taxation, workers compensation and **relevant occupational health and safety requirements**.*

Contractors, including principal contractors, must comply with minimum personal protective equipment (PPE) requirements as detailed in this document. Contractors must ensure their workers are fit tested and trained in the correct use, maintenance and storage of PPE; and providing evidence as required. An example where Queensland Health may provide fit

testing to contractors may be when a contractor has been engaged through an HR process to fill an existing FTE position (e.g. hired through an agency).

Recommendations

1. Clearly identify priority risk category workers in healthcare settings to be enrolled in a fit test program.
2. Ensure staff being fit tested are competent with PPE donning and doffing procedures and have a good understanding of disease transmission and identification of respiratory hazards (clinical and non-clinical).
3. Continue to ensure that training on the use of PFRs reinforces the requirement for the wearer to perform a fit check every time a PFR is fitted.
4. Wherever available and reasonably practicable, quantitative fit testing should be used in preference to qualitative testing.
5. Where a successful fit test is unable to be achieved, take measures to ensure alternative management – either through reallocation of duties, or development of an alternative, personalised PPE plan.
6. Establish processes to be followed when a worker requires respiratory protection and no PFR for which they have been fit tested is available, noting that ISO 16975-3:2017 and AS/NZS 1715:2009 provides guidance on this matter.
7. Maintain a database of fit testing outcome data using the enterprise, including workers name, date, payroll number, and result of testing and of instances where staff have continued to perform duties in situations where the wearing of a PFR and compliance of fit testing was required by relevant legislation, standards and guidance.
8. Ensure that an educational program for fitting and removal of PFRs is provided, that focuses on the location and method for safe donning and doffing of PFRs to prevent the risk of transmission of healthcare associated infection (self-contamination). Required frequency of refresher training should also be considered.
9. Consultation with relevant staff and Health and Safety Representatives within the organisation should occur when implementing arrangements to comply with legislation, standards and guidance for fit testing PFRs.
10. Staff should know escalation pathways when issues arise from use of respirators such as pressure injuries.

Consultation in the development of this Guideline

This guideline was developed in consultation with:

- Health and Safety Unit, Human Resources Branch, Corporate Services Division
- The Queensland Health, Queensland Infection Clinical Network
- Queensland Infection Prevention and Control Unit, Communicable Diseases Branch, Queensland Health
- Queensland Health Fit Testing Community of Practice (Technical expertise)
- Office of the Chief Nurse and Midwifery Officer
- Clinical Placements Program Management Team

- Work Health and Safety Manager Forum Network (Statewide)
- Executive Directors of People and Culture (Statewide)
- Union/Industrial partners
- Workforce Relations and Policy Unit, Human Resources Branch, Corporate Services Division.

Definitions

Term	Definition
Aerosol generating procedure (AGP)	Any medical procedure that can induce the production of aerosols of various sizes, including small (>5µm) particles Source: World Health Organisation (WHO), Queensland Health.
Assigned Protection Factor	Anticipated level of respiratory protection that would be provided by a properly functioning RPD or class of RPD within an effective RPD program Source: AS/NZS ISO 16975.3:2023
Donning and Doffing	Safe fitting and removal of PPE, PPE Donning and Doffing [Video] Source: Queensland Health
Fit check	A simple check to ensure the respirator fits each time it is worn. Fit checks ensure the respirator is sealed over the bridge of the nose and mouth and that there are no gaps between the respirator and face. Fit checking must be performed each time a respirator is used, regardless of whether previous fit testing has been performed. See P2/N95 Mask fit checking [Video] (https://vimeo.com/396839756/caae55d0a5?embedded=true&source=vimeo_logo&owner=52045026). Source: AS/NZS 1715:2009 - Selection, use and maintenance of respiratory protective equipment. Queensland Health
Fit factor	Numeric value established as a pass/fail point of acceptance criterion for quantitative fit testing. Quantitative fit factor is the fit of a particular tight-fitting respiratory interface to a specific individual. A successful test requires a fit factor greater or equal to 100 for any disposable PFR. Source: AS/NZS ISO 16975.3:2023
Fit test	A validated method of matching a PFR to an individual. There are two categories of fit test: qualitative and quantitative. A qualitative fit test gives pass or fail results and relies on a subject's response to a test agent. A quantitative fit test gives numerical results and does not rely on the subject's response to a test agent. Source: AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment

Term	Definition
Healthcare worker/s (workers in a healthcare setting/s)	Health care workers means all workers (including non-clinical) who work in the facilities or services in scope for this guidance Source: Queensland Health
P2/N95 PFR	P2 and N95 masks (Particulate Filter Respirators PFR) are designed to help reduce respiratory exposure to airborne contaminants. They are used when there is a high probability of transmission from particles or droplets in the air. P2 and N95 masks must have a good facial fit to be effective. Source: Safe Work Australia
Powered air-purifying respirator (PAPR)	A device incorporating a half facepiece, full facepiece or head covering which provides the wearer with air filtered through a powered filtering unit, comprising a filter or filters and an electrically operated blowing unit. Source: AS1715:2009 Selection, use and maintenance of respiratory protective equipment
Respiratory protective device (RPD)	Personal protective equipment designed to protect the wearers respiratory tract against inhalation of hazardous atmospheres/substances Source: As/NZS ISO 16975.3:2023

History

Date	Change
10 October 2024	Revision and realignment to revised supporting documentation. Previous implementation guidance adopted as a formal guideline under Queensland Health's Health, safety and wellbeing risk management standard (QH-IMP 401-3). Prepared by Health and Safety Unit, Human Resources Branch, Corporate Services Division.
February 2023	Revision following consultation. Version V2.3 prepared by Health and Safety Unit, Human Resources Branch, Corporate Services Division.
January 2023	Revision following consultation. Version V2.2 prepared by Health and Safety Unit, Human Resources Branch, Corporate Services Division.
November 2022	Review and revision. Realignment to revised supporting documentation. Version V2.1 prepared by Health and Safety Unit, Human Resources Branch, Corporate Services Division.

November 2021 – January 2022	PPE Working Group - Major editorial changes – changes to headings and flow of document, duplication removed. Strengthened recommendation for quantitative fit testing. Addition of Appendix 1 Work instruction for fit testing incorporating eHealth Maskhelper tool. Appendix 1 based on THHS Standard Operating Procedure Quantitative RPE Fit Testing. Version V1.1
March 2021	PPE Working Group – Review. Version V1.0 prepared by PPE Working Group
March 2021	Dr Alex Markwell on behalf of PPE Working group - Incorporating further feedback and updated national guidelines. V0.10
September 2020 - February 2021	Fit testing working group and then PPE Working Group of the CRG. V0.1 – V0.09 prepared by PPE Working Group

References

- Workplace Health and Safety Queensland. Fit-testing requirements for tight-fitting respirators (https://www.worksafe.qld.gov.au/__data/assets/pdf_file/0025/26638/5844-fit-testing-requirements-for-tight-fitting-respirators-flyer.pdf) 2018.
- Standards Australia. AS/NZS 1715:2009 Selection, use and maintenance of respiratory protective equipment. Sydney: Standards Australia; 2009. See Department of Health Standards Australia Licence Home Page (<https://qheps.health.qld.gov.au/standards>) (internal link).
- Australian Institute of Occupational Health. A guide to buying P2, or equivalent, respirators for use in the Australian & New Zealand work environment (<https://www.aioh.org.au/product/p2-guide/>) 2022.
- Therapeutic Goods Administration. Regulation of personal protective equipment and COVID-19 (<https://www.tga.gov.au/news/news/regulation-personal-protective-equipment-and-covid-19>) 2021.
- National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare (<http://www.nhmrc.gov.au/health-advice/public-health/preventing-infection>) 2019.
- Queensland Health Infection prevention and control guidance (including PPE advice) (<https://www.health.qld.gov.au/clinical-practice/guidelines-procedures/novel-coronavirus-qld-clinicians/personal-protective-equipment-ppe>).
- Facial Injury and Respiratory Protective Equipment (Queensland Health) (https://www.health.qld.gov.au/__data/assets/pdf_file/0030/1139943/facial-injury-rpe-guideline.pdf).
- Best-practices for preventing skin injury beneath personal protective equipment during the COVID-19 pandemic: A position paper from the National Pressure Injury Advisory Panel - PMC (nih.gov) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8013459/>).

- Respiratory Protection Program Manual, v2.0 (<https://www.cec.health.nsw.gov.au/keep-patients-safe/infection-prevention-and-control/COVID-19/respiratory-protection-program>).
- N95 respirator associated pressure ulcer amongst COVID-19 health care workers - PMC (nih.gov) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7272882/>).
- Queensland Health Enterprise architecture QH-HSD-015:2014 (<https://www.health.qld.gov.au/system-governance/policies-standards/health-service-directives/enterprise-architecture>).

Additional resources

- Infection Prevention and Control (IPC) for Infectious Respiratory Diseases Clinical Guideline South Australia Health Clinical Guideline V1.5 ([https://www.sahealth.sa.gov.au/wps/wcm/connect/Public Content/SA Health Internet/About us/Governance/Policy governance/Policies/Infection Prevention and Control IPC for Infectious Respiratory Diseases Clinical Guideline](https://www.sahealth.sa.gov.au/wps/wcm/connect/Public+Content/SA+Health+Internet/About+us/Governance/Policy+governance/Policies/Infection+Prevention+and+Control+IPC+for+Infectious+Respiratory+Diseases+Clinical+Guideline)).
- NSW Clinical Excellence Commission Respiratory Protection Program (<https://www.cec.health.nsw.gov.au/keep-patients-safe/infection-prevention-and-control/COVID-19/respiratory-protection-program>).
- Victorian Respiratory Protection Program, State of Victoria, Australia, Department of Health and Human Services (<https://www.health.vic.gov.au/quality-safety-service/victorian-respiratory-protection-program>).
- Guidance on the use of personal protective equipment (PPE) for health care workers in the context of COVID-19 (<https://www.health.gov.au/resources/publications/guidance-on-the-use-of-personal-protective-equipment-ppe-for-health-care-workers-in-the-context-of-covid-19>). Infection Control Expert Group.
- First nations culturally appropriate Principles of fit check for P2/N95 respirator (poster – Queensland Health) (https://www.health.qld.gov.au/__data/assets/pdf_file/0026/1160990/poster-ppe-respirator.pdf).
- Principles of fit check for P2/N95 respirator (poster – Queensland Health) (https://www.health.qld.gov.au/__data/assets/pdf_file/0035/974294/p2-n95-fit-check.pdf).
- AS/NZS ISO 16975.3 Respiratory protective devices – Selection and maintenance – Part 3: Fit testing procedures. See Department of Health Standards Australia Licence Home Page (<https://qhpeps.health.qld.gov.au/standards>) (internal link).

Appendix 1 – Fit test work instruction – PortaCount (Quantitative testing)

A fit test is a validated method that determines the respirator that provides an adequate match between the wearer's facial characteristics and the seal of a close-fitting respirator. The most commonly used respirator in Queensland Health hospitals are disposable particulate filter respirators (PFRs, also known as P2 or N95 respirators). Currently Queensland Health Hospital and Health Services conduct fit testing with PortaCount Respirator Fit Test machines using FitPro ultra fit test software measuring the concentration of microscopic particles in the ambient air and the concentration of those particles that leak into a PFR during the fit test. The ratio of these two concentrations is called the fit factor.

The test is done while a person is wearing a PFR attached to a testing unit and carrying out a number of physical movements. A fit test does not replace the need to conduct a fit check every time a PFR is used. The results indicate the effectiveness of the seal of a specific model of PFR against the face. While each physical movement done during the test gives a fit factor result, the overall fit factor from the combined scores is used to determine if the respirator provides the level of protection required.

Prior to fit testing, the person must be aware that they need to be clean shaven and should not eat, drink, vape or smoke cigarettes for at least 30 minutes before fit test is carried out.

The test must be conducted with additional items normally worn by workers in healthcare settings. Examples are prescription glasses, face shield/eye protection, head wear and any approved prophylactic skin protection⁴⁵. For further details please see Facial Injury and Respiratory Protective Equipment Guidance (https://www.health.qld.gov.au/__data/assets/pdf_file/0030/1139943/facial-injury-rpe-guideline.pdf).

After donning the respirator without assistance, the worker in a healthcare setting will wear the PFR for a period of 5 minutes acclimatisation, to ensure no further adjustments are required for comfort and ensure accuracy of a fit check. The Portacount machine is turned on to ensure that air flows away from the workers in a healthcare setting. During the 5-minute acclimatisation, the Portacount machine purges ambient particles in the respirator, and assists the worker in a healthcare setting to test their breathing comfort.

⁴ N95 respirator associated pressure ulcer amongst COVID-19 health care workers - PMC (nih.gov) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7272882/>)

⁵ Best-practices for preventing skin injury beneath personal protective equipment during the COVID-19 pandemic: A position paper from the National Pressure Injury Advisory Panel - PMC (nih.gov) (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8013459/>)

The fit tester will perform hand hygiene prior to commencing. Assist workers to perform a fit check (see https://www.health.qld.gov.au/__data/assets/pdf_file/0035/974294/p2-n95-fit-check.pdf) prior to starting test, which should be confirmed by the real time fit check function on the PortaCount to ensure mask fits and does not need to be readjusted, and Fit Test Exercises as detailed in this guideline

This sequence is repeated for each PFR tested. A fit test will be conducted against a minimum of two PFR to enable individual workers in healthcare settings access to tested PFR. Access to fit testing is linked to the risk assessment of the worker potential exposure to recognised and unrecognised sources of airborne and aerosolised infectious agents in the workplace, prioritising those staff who are assessed as at being of greatest risk of exposure.

Hand hygiene, cleaning of equipment and appropriate disposal of waste is to be carried out after each person finishes the fit testing procedure.

Resources and requirements

Quantitative respirator fit testing requires a competent fit tester as required by AS/NZ1715, to prepare and administer a fit test using available Queensland Health procured RPE. Testing should occur in a standardised approach to limit biases caused by fit testers or personnel being fit tested.

Results and Pass Levels

A minimum Fit Factor Rating of 100 of P2/N95 respirators is necessary to be deemed a pass. Full face reusable RPE (including close-fitting facepiece PAPR) must achieve a minimum FFR of 500 to be deemed a pass. Fit Factors are provided at the end of each exercise; however, it is the Overall Fit Factor that determines a pass or fail. Individual fit factors allow early termination of a fit test when a test is destined for failure i.e. an individual exercise fit factor ≤ 45 is unlikely to pass overall especially when there is no or limited recovery on the subsequent exercise.

Equipment

- Quantitative fit testing machine
- Fit-Testing Attachments (reusable PFR and PAPRs) Test RPE (disposable PFR)
- Computer (preferably laptop)
- Portable device (Research fit tests only ipad/tablet)
- Particulate Generator

Reagents and Consumables

- Reagent grade Isopropyl Alcohol
- NaCl tablets – 100mg
- Sample probes (disposables)
- Disinfectant Wipes
- Test PFR (disposables)
- Associated consumables (twin tube assembly, HEPA filter, alcohol wick)
- PortaPunch Probe insertion tool.
- Compressed air

- Hand gel for hand hygiene
- Antiseptic Hand rub Labels (research fit tests only)

RPE Fit Testing Preparation

Follow all manufacturer's guidance and requirements for the use of a fit testing machine. Should these instructions vary from the guidance offered in this section, the fit testing machine manufacturer's instructions should prevail.

The fit testing machine must be within the calibration date (12 months) as specified by the manufacturer) and used in an area where a suitable atmosphere for fit testing can be established.

When used to create a suitable atmosphere, the particle generator must have the reservoir filled and one whole (crushed) 100mg salt (NaCl) tablet added. Start the particle generator approximately fifteen (15) minutes prior to completing the daily check to build the number of particulates up in the atmosphere.

Ensure that the alcohol cartridge reservoir is filled (to the indicator line approximately halfway up the reservoir) with reagent grade isopropyl alcohol and that the wick internal to the cartridge has had time to absorb the alcohol if starting from a dry wick and reservoir. Remove the cap from the fit testing machine and insert the alcohol cartridge being careful not to use excessive force as the locating tab is prone to failure.

Turn on the fit testing machine and ensure that it is connected to a network enabled Queensland Health computer (where available). Alternatively export to a USB as backup. Ensure that the sampling tubes are connected to the appropriate inlets (colour coded blue – blue, clear – clear). Turn on the Queensland Health computer and open the fit testing software (e.g. FitPro). Connect the fit testing machine in the fit testing software and commence the daily checks. Follow the on-screen instructions for the daily checks ensuring that N95 is selected when testing P2/N95 RPE. Once the daily checks are complete the fit testing machine is ready to commence sampling.

Fit testing consumable management

1. Review consumables and order as necessary. Isopropyl Alcohol and salt tablets are ordered through vendor or pharmacy.
2. Fit Testing machine consumables (sampling tube and sample probes) are ordered through the OEM (original equipment manufacturer) supplier.
3. Follow manufacturer instructions for reprocessing all components of the fit testing equipment.

Quality controls and acceptance criteria

Fit Testing machine Annual Calibration (contact vendor) and daily checks.

Record keeping and reporting

Record and report respirator fit testing in accordance with local HHS requirements and the Queensland Health approved enterprise data recording system.

Appendix 2 - Procedure for incorporating Maskhelper into fit testing

The Maskhelper application aims to increase efficiency, particularly waste reduction, as well as uniformity and standardisation of quantitative fit testing underpinned by artificial intelligence (AI)- based facial recognition system.

Using AI-based facial recognition, Maskhelper provides an increased chance of initial choice of a respirator that will be able to achieve a successful fit test. As of 23 November 2021, Maskhelper's accuracy provides approximately a 90% probability of a correct fit. Further, if the first chosen mask is correct there is an increased predictability with the second and subsequent choices for an individual. Use of Maskhelper saves time for the fit test in both the fit tester and the worker being fitted, gives an alternative in the event of supply chain difficulties, and prevents wastage of respirators.

Maskhelper work instruction.

This work instruction provides information for fit testing programs to incorporate the use of the eHealth Maskhelper tool into the fit testing process as a first step triaging tool to make best use of the limited resources for fit testing. The work instruction covers all fit testing for all particulate filter respirators that require a close fitting facepiece and subsequent seal with the user's face. This work instruction is based on Townsville Hospital and Health Service's Standard Operating Procedure Quantitative RPE Fit Testing, and the work of the team at Townsville Hospital and Health Service is acknowledged.

1. Fit-Tester Logs into the local eHealth Maskhelper tool at Maskhelper (health.qld.gov.au)
2. Fit-Tester provides "Terms of Participation" that includes pop up link for consent form (PICF).
3. Fit tester selects "Add on behalf of" button the top right of the eHealth Maskhelper tool. This enables the searching of Queensland Health personnel via the "fit test on behalf of" field which is linked to DSS and anonymised to researchers.
4. Enter the reference ID number for the workers in a healthcare setting based on numerical order of workers for that day (01-99) for that site. e.g., TUH-22032021-01, TUH-22032021-02 and so on.
5. Record the workers research ID# on a self-adhesive label and apply to participants name badge or clothing. This is to ensure that no participant identifiable information is photographed.
6. Fit-Tester takes a frontal, left and right side of face photo of the workers in a healthcare setting (that includes reference ID label).
7. The eHealth Maskhelper tool will analyse the photo and select up to two RPE based on the workers in a healthcare setting's facial characteristics.
8. Fit tester must perform hand hygiene prior to handling RPE, fit test attachments or sample ports.
9. Fit tester selects the recommended PFR and instructs the worker to don the PFR to perform a Fit Check for each PFR.

- A. If the Fit Check obviously fails, do not proceed to quantitative fit testing – record comments such as likely fail point(s).
 - B. If the Fit Check passes proceed to quantitative fit testing.
10. Insert the sample port into the selected RPE using the provided tool, ensure that the port is positioned approximately halfway between the workers mouth and nose.
 11. Connect the sampling tube to the RPE sampling port or attachment and request the worker to don the PFR.
 12. Allow the participant to fit the PFR as they normally would, observe the placement of the RPE on the face the positioning of the straps and the method of adjusting the nose piece. Depending on local policy and workflow, take this opportunity to educate the worker on correct fitting and removal, and performing a fit check.
 13. Commence the fit test, instruct the workers to follow the Modified OSHA protocol.
 14. If a fail is likely and issue(s) have been identified with RPE fitting, take this time to adjust and review improvement/regression.
 15. If a fail occurs, select alternative RPE
 16. Once the worker passes with an overall fit factor of 100 or greater, complete the fit test certificate and provide to the worker (either in hard or electronic copy).
 17. Complete research data including workers feedback and submit.
 18. Complete FiTR record and local record (e.g., Learning Management System / LOL) so that the worker has access to their fit testing record. Record all exercise Fit Factor and Overall Fit Factor Ratings – record comments such as adjusted fit bottom strap below ear, adjusted placement on nose, etc.
 19. Once the recommended masks have been completed ensure that all Fit Factors, Overall Fit Factor Ratings, and comments have been completed before submitting eHealth Maskhelper tool.
 20. If none of the recommended masks achieve a satisfactory fit, choose further masks from the drop- down menu on the eHealth tool to complete further testing and record Fit Factors, Overall Fit Factors, and comments.

Post – Fit testing

21. Perform hand hygiene and disinfect the fit testing equipment including the sampling tube, any reusable respirators, reusable respirator attachments, rainbow passage, mirror, and hard surfaces around the fit testing machine using disinfection wipes.
22. Place the portable device on charge ready for the next worker.

Appendix 3 - Example risk assessment

Hospital and Health Service:			
Location:		Ward / Work area:	
Officers involved in risk assessment:			
Approving officer:			
Ward/work area:			
Regularly monitoring and review of the risks of harm associated with respiratory hazards is required in view of: <ul style="list-style-type: none"> • Community prevalence of infections • New variants of concern (VOC) • Number of outbreaks and rates of nosocomial infection • Peak body guidance 			
Which workers may be exposed to the hazard and number of workers who may be affected (consider community workers and trades persons)			
Medical	Nursing	QAS Paramedic	
Health Practitioner	Operational	Administration	
Technical	Building and Engineering	Dental	
Professional	Student, Volunteer and Contractor	Clinical Assistant	
Aboriginal and Torres Strait Islander Health Workforce		Other	
Identify workers who are increased risk due to: age, ethnicity, or immunocompromise:			
Description of risk assessment:			
Describe the potential exposure to recognised and unrecognised sources of airborne and aerosolised infectious agents, chemical hazards (neoplastic agents, cleaning products, etc.) in your area. <ul style="list-style-type: none"> • Aerosol generating procedures/aerosol generating behaviours or other similar procedures. • Acute respiratory infection pathogens including Influenza (A and B), SARS-CoV2 (COVID-19), Respiratory syncytial virus (RSV) Parainfluenza virus, Human metapneumovirus, Rhinovirus, Pertussis. • Identify respiratory risks for tasks performed in work area. 			
Take into consideration: Exposure time (Duration), Frequency of exposure, Likelihood of exposure, Situation/activity risking exposure, Quality of ventilation:			
Key risk exposures – identify likelihood (examples below)			
Management of patients with tuberculosis		Management of patients with COVID-19	

Management of patients with measles / chickenpox	Another airborne infectious agent/airborne hazard
Quality of ventilation	
List the current control measures in place, and those to be implemented, including:	
<p>1. Standard precautions – use PPE when there is an anticipated or likely risk of contamination with splashes of blood or body substances and based on the nature of care or the task being undertaken.</p> <p>2. Transmission-based precautions – consider the need for contact, droplet and airborne precautions based on the mode of transmission when caring for patients with epidemiologically important or transmissible pathogens with high-risk consequences that can transmit or cause infection.</p> <p>3. Queensland Health Acute Respiratory Infection–Infection Prevention and Control– the level and type of PPE for clinical care of suspected/confirmed ARI patients should be based on the risk assessment.</p> <p>4. Airborne hazardous particulate control measures</p>	
Adequate supply of PFRs	Adequate range of PFRs
Supply and control of alternative respirators e.g., PAPRs	Relevant workers compliant with fit test requirements
Access to fit testing	Fit checking embedded into education and clinical practice

Other (refer to Figure 1: Hierarchy of control measures)

Risk Category		
1		
2		
3		
4		

Risk assessment tools

Consequence assessment

Type of consequence	Negligible	Minor	Moderate	Major	Extreme
People, property and environment	No structural or equipment damage. No environmental damage. No injury/illness or first aid treatment only. No time lost. (SAC 4)	Minor structural or equipment damage. Limited escape to onsite environment. Medical treatment required for injury. A full shift has not been lost. (SAC 3)	Moderate structural or equipment damage. Some offsite environmental damage. Lost time or injury or illness without permanent impairment. (SAC 2)	Major structural or equipment damage. Some offsite environmental damage. Serious injury or illness with permanent impairment. (SAC 1)	Catastrophic structural or equipment damage. Significant offsite environment impact. A loss of life. (SAC 1)

Likelihood (probability) assessment

Likelihood of incident occurring (from assessment information gathered)

Almost certain	The risk event is likely to occur in most circumstances (>90%)
Likely	The risk event will probably occur at least once (60-90%)
Possible	The risk event could occur at some time (30-60%)
Unlikely	The risk event could occur sometime but is not expected (5-30%)
Rare	The risk event may occur only in exceptional circumstances (<5%)

Risk analysis matrix

The risk matrix shall be used following the likelihood and consequence assessment.

Likelihood ↓	← Consequence →				
	Negligible	Minor	Moderate	Major	Extreme
Almost certain	Medium (7)	Medium (11)	High (17)	Very high (23)	Very high (25)
Likely	Medium (6)	Medium (10)	High (16)	High (20)	Very high (24)
Possible	Low (3)	Medium (9)	Medium (15)	High (18)	High (22)
Unlikely	Low (2)	Medium (8)	Medium (12)	Medium (14)	High (21)
Rare	Low (1)	Low (4)	Low (5)	Medium (13)	High (19)

Risk rating assessed Low Medium High Very high

Possible consequence Negligible Minor Moderate Major Extreme

Response to risk

Risk rating	Response to the risk
Very high	<p>As soon as possible (and within one month) commence treatment planning for moderation.</p> <p>Monthly review by risk owner until effectively managed (e.g. within risk appetite). This includes risk treatment status updates.</p> <p>Monthly—provide risk update as relevant to governing body or management team and risk stakeholders.</p>
High	<p>Within one month - commence treatment planning for moderation.</p> <p>Monthly review by risk owner until effectively managed (e.g. within risk appetite). This includes risk treatment status updates.</p> <p>Monthly—provide risk update as relevant to governing body or management team and risk stakeholders.</p>
Medium	<p>Within three months - evaluate for treatment planning requirements based on cost/benefit and resource prioritisation.</p> <p>Quarterly – review by risk owner. This includes risk treatment status updates (if applicable).</p> <p>As required, provide risk update as relevant to governing body or management team and risk stakeholders.</p>
Low	<p>Maintain effectiveness of current controls and manage by routine procedures.</p> <p>Monitoring and review schedule should be considered based on potential rapid escalation/volatility of the risk.</p> <p>As required, provide risk update to governing body or management team and risk stakeholders.</p>