Policy

Clinical Guideline

Title: Guideline for Respiratory Protection against Airborne Infectious Diseases

Objective file number:
Policy developed by: Infection Control Service, CDCB
Approved SA Health Safety & Quality Strategic Governance Committee on: 10 December 2013
Next review due: 31 December 2016

Summary

The SA Health Guideline for Respiratory Protection against Airborne Infectious Diseases provides guidance to workers and employers regarding respiratory protection against airborne infectious diseases. It promotes the adoption of a risk management approach to a respiratory protection program based on the risk of exposure to infectious airborne pathogens, especially those with high morbidity/mortality.
The guideline describes systems for the delivery of care that is in accordance with the National Safety and Quality Health Service Standard 3, 2012, Australian Commission for Safety and Quality in Health Care.

Keywords P2 respirator, respiratory protection, TB, measles, aerosol generating procedures, AGP, clinical guideline, masks, high filtration

Policy history
Is this a new policy? **Y**
Does this policy amend or update an existing policy? **N**
Does this policy replace an existing policy? **N**
If so, which policies?

Applies to
All SA Health Portfolio
All Department for Health and Ageing Divisions
All Health Networks
CALHN, SALHN, NALHN, CHSALHN, WCHN, SAAS
Other

Staff impact
N/A, All Staff, Management, Admin, Students, Volunteers
All Clinical, Medical, Nursing, Allied Health, Emergency, Dental, Mental Health, Pathology

PDS reference D0335

Version control and change history

Version	Date from	Date to	Amendment
1.0	10/12/2013	31/12/2016	Original version

Government of South Australia
SA Health

Guideline for Respiratory Protection against Airborne Infectious Diseases

December 2013

Government of South Australia
SA Health

Disclaimer

This guideline provides advice of a general nature. This state-wide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this state-wide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected t review specific details of each patient and professionally assess the applicability o the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom and detailed reasons for the departure from the guideline.

This state-wide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for:

- discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes the use of interpreter services where necessary,
- advising consumers of their choice and ensure informed consent is obtained.
- providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct and
- documenting all care in accordance with mandatory and local requirements.

Document title	Guideline for Respiratory Protection against Airborne Infectious Disease
First developed:	2013
Version Number:	1
Author:	Infection Control Service, Communicable Disease Control Branch
Audience:	Medical, nursing, midwifery and allied health staff in South Australia public and private services
Endorsed by:	SA Health Safety & Quality Strategic Government Committee
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This document provides information and guidance to workers and employers regarding respiratory protection against airborne infectious diseases. It promotes the adoption of a risk management approach to a respiratory protection program based on the risk of exposure to infectious airborne pathogens, especially those with high morbidity/mortality.

It does not provide guidance for the use of powered air-purifying respirators (PAPR), chemical or cytotoxic exposures, laser plumes and SA dental settings.

Background

The use of respirators should be considered as the last line of defence in the hierarchy of infection prevention measures, including: immunisation, hand hygiene, environmental measures (including sufficient ambient ventilation), single rooms, and early recognition of infectious status. In the majority of situations where respiratory protection is required, a fluid resistant surgical mask is recommended. However, for a small number of pathogens that are transmissible via the airborne route or where aerosol-generating procedures (AGP) are undertaken a correctly fitted respirator will be required.

A correctly fitted P2 (or equivalent) respirator should be used when attending to all patients with confirmed or suspected serious airborne diseases and when performing aerosol generating procedures on patients with a known or suspected respiratory infection or other disease transmitted via the airborne route. In order for a P2 respirator to provide maximum protection it is essential that the wearer be properly fitted and trained in its safe use. A risk management approach should be applied to ensure that workers working in high risk areas are fit tested and know how to perform a fit check. Refer to the Risk Assessment for P2 respirator fit testing section.

Note: Influenza does not require the routine wearing of a P2 respirator EXCEPT in the context of a pandemic of a novel virus, in which case refer to current pandemic guidelines.

Definitions

Aerosol

A mist composed of very small, lightweight particles that can remain suspended in the air for long periods of time and can travel long distances. These particles can penetrate the respiratory system and are generally <5 microns in diameter.

Aerosol-Generating Procedures (AGP)

AGPs are procedures that may be more likely to generate higher concentrations of infectious respiratory aerosols than coughing, sneezing or breathing. For the purpose of this guideline, the following are classified as AGPs: bronchoscopy, collection of lower respiratory tract specimens (including use of hypertonic saline nebulisation for collection of respiratory specimens), endotracheal intubation and open airway suctioning of lower airways.

NOTE: *The administration of nebulised medication, acquisition of nasopharyngeal swabs and use of high flow oxygen may be considered aerosol generating procedures. However, there is little evidence for transmission by this route.*[1,2,3] *During nebulisation, the aerosol derives from a non-patient source (the fluid in the nebuliser chamber) and does not carry patient-derived viral particles. Standard & Droplet precautions are required for these procedures but they should be undertaken in a separate area to minimise risk.* ***It is preferable that nebulised medication delivery be avoided and medication delivered via a spacer instead.***

Airborne transmission

Transmission of infection by very small particles (generally <5 microns in size) being generated from the respiratory tract of an infected individual during activities such as coughing, sneezing and during some procedures that are capable of forming aerosols which can be inhaled by other persons.

Droplet transmission

Transmission of infection by larger particles (generally >5 microns in size) that are expelled when coughing, sneezing or talking but do not remain suspended in the air and only travel short distances (approximately one metre) from the patient. [5,6]

Fit check (user seal)

A procedure that must be performed every time a P2 respirator is used to ensure it is properly applied. This includes exhaling and inhaling once a respirator is applied to check the seal. If leaks are detected then the respirator must be readjusted. (Refer to Appendix 1: P2 respirator donning and fit checking

Fit test

A validated method that determines the brand and size of respirator most suited to the individual's face.

Powered air-purifying respirator (PAPR)

Powered air-purifying respirators (PAPR) use a power source to drive ambient air through a high-efficiency particulate air (HEPA) filter prior to inhalation by the wearer, increasing the filtration performance over the P2 respirators. However, PAPR devices are expensive, cumbersome, and noisy and require significant ongoing maintenance.

Respirator

Respirators are medical devices designed to protect the wearer from infectious aerosols generated directly from the patient or created during aerosol-generating procedures e.g. bronchoscopy. The respirators generally used in healthcare settings are able to filter out approximately 94% of particles <5 microns in size and are known in Australia as P2 (approximately equivalent to N95 in USA or FFP2 in the UK).

Respiratory Infection

An infectious process affecting any part of the upper or lower respiratory tract. Symptoms can include fever, runny nose, sore throat and cough, joint or muscle pain, lethargy, chest pain and difficulty breathing

Surgical mask

A loose-fitting, single-use disposable facemask that creates a physical barrier between the mouth/nose of the wearer and potential contaminants in the immediate environment, as well as reducing the spread of respiratory droplets from the wearer. It is recommended that a fluid resistant mask is used.

Guideline

Immunisation

All healthcare workers should be fully immunised in line with the *Immunisation Guidelines for Healthcare Workers in South Australia (2012)* and their immune status to vaccine preventable diseases be recorded.

Personal Protective Equipment (PPE) Competency Assessment

- All healthcare workers required to wear PPE must be trained and assessed for competency in the use of all PPE as part of an ongoing training program. The Training Tool for the Correct Use of Personal Protective Equipment & Respiratory Mask Fit Testing is available on the SA Health website and will assist in worker training.
- All healthcare workers must be assessed for their risk of exposure to serious airborne infections against the risk assessment guidance provided in the "Risk assessment for P2 respirator fit testing" section on page 9. Depending on the level of risk, workers may require fit testing.

For those healthcare workers required to wear a P2 respirator, fit testing should be undertaken:

1. prior to working in a high risk area
2. 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)
3. when failing to demonstrate a proper fit check at annual competency assessment.

Fit testing

There are two types of facial fit test – qualitative and quantitative:

- **A qualitative fit test** is fast and simple but can be influenced by the wearer. It relies on the wearer's senses to determine if there is a gap in the seal of the respirator to the wearer's face. Test agents such as saccharin or BitrexTM (a bitter tasting aerosol) are used at a sensitivity level that demonstrates the user will be able to appropriately sense the presence of the test agent within the respirator by taste, smell or the urge to cough.
- **A quantitative fit test** requires the use of specialised equipment (such as Portacount™ Plus machines) to provide quantitative, or numerical measurements of the amount of face seal leakage present when a given respirator is donned by a particular user.

Portacount™ Plus Machines

SA Health has provided Portacount™ Plus machines to all Local Health Networks for use within their healthcare facilities.

- it is the responsibility of the Local Health Network to ensure that the equipment is maintained in good order and regularly serviced i.e. annually
- users must be adequately trained prior to operating the machine
- a designated person should be nominated to ensure that the machine is used and maintained correctly by a trained operator.

To ensure a continued adequate fit, an annual competency assessment which involves donning and doffing of the respirator and a fit check is required. The “real time” fit test function of the Portacount™ Plus machine can be used.

Selection of respirators

Initial selection of a suitable respirator for fit testing an individual should be made according to the tester’s visual assessment of the facial characteristics of the wearer. Where possible one of the brands/sizes contained within the state respirator stockpile should be chosen. These are:

- 3M P2 9320 flatfold – OSFA
- 3M N95 1870 flatfold – OSFA (essentially the same product)
- 3M P2 8210 cupped – small
- Kimberley Clark Fluidshield PFR95 – regular
- Kimberley Clark Fluidshield PFR95 – small
- Smith & Nephew Proshield N95 – medium
- Smith & Nephew Proshield N95 - small

Applicable Legislation and Standards:

1. *Australian/New Zealand Standards that apply:*
   - AS/NZS 1715:2009 - Selection, use and maintenance of respiratory protective equipment
   - AS/NZS 1716:2012- Respiratory protective devices.

2. *National Safety and Quality Health Service Standards*. Standard 3, Preventing and Controlling Healthcare Associated Infections, criterion 3.7.1 requires infection prevention and control consultation regarding policies and procedures that address personal protective equipment

3. *The Australian Guidelines for the Prevention & Control of Infection in Healthcare (2010)* recommends that where there is a high probability of airborne transmission due to the nature of the infectious agent or procedure then a correctly fitted P2 respirator should be worn

4. The Policy for Control of Tuberculosis (TB) in South Australian Health Services (2009) also states that healthcare workers must use a correctly fitted P2 respirator when attending identified or suspected infectious cases of pulmonary TB.

5. *Work Health and Safety Act 2012:* (Section 19)
   - Division 2 – Primary duty of care, states that the health and safety of other persons is not put at risk from work carried out as part of the business or undertaking and must provide and maintain so far as is reasonably practicable:
     - A safe working environment without risks to health and safety
     - Information, instruction, training, instruction or supervision that is necessary to protect all persons from risks to their health and safety arising from work carried out as part of the conduct of the business or undertaking.
   - Division 4 – Duty of officers, workers and other persons, Section 28 of the Act states that an employee must:
     - Take reasonable care for his or her own health and safety
     - Take reasonable care that his or her acts or omissions do not adversely affect the health and safety of other persons
     - Comply with any reasonable instruction
     - Cooperate with any reasonable policy or procedure.

Risk Assessment for P2 respirator fit testing

The need for P2 respiratory protection varies with the disease and the immune status of the worker. Workers known to be immune to measles (rubeola virus) or chickenpox (varicella zoster virus) are not required to wear P2 respirators when caring for patients with these diseases. Where possible, workers who are not immune should not be allowed to care for patients with these diseases**.**

P2 respiratory protection must be worn by workers in the following circumstances:

- While caring for patients who have a known or suspected high morbidity/mortality airborne disease e.g. TB, severe acute respiratory syndrome (SARS), extra pulmonary draining TB lesions when performing wound irrigation (due to aerosolisation of exudate).

OR

- Where aerosol generating procedures (AGPs) are being performed on patients with a suspected or confirmed high morbidity/mortality airborne or respiratory infection.

Priority for fit-testing is based on the likelihood of a worker required to be:

- Present in a room where there is a patient confirmed or suspected to have a high morbidity/mortality airborne or respiratory infection.

OR

- Present in a room where an AGP is being performed on a patient with a known or suspected high morbidity/mortality airborne or respiratory infection.

High risk areas:

- Emergency Departments
- ICU, Paediatric/Neonatal Units
- Wards with negative pressure rooms or respiratory isolation rooms
- Bronchoscopy Units
- Operating rooms where bronchoscopy or other aerosol generating procedures are performed.

High risk workers:

- Clinicians who work in high risk areas e.g. nurses, doctors, physiotherapists, speech pathologists, radiographers.

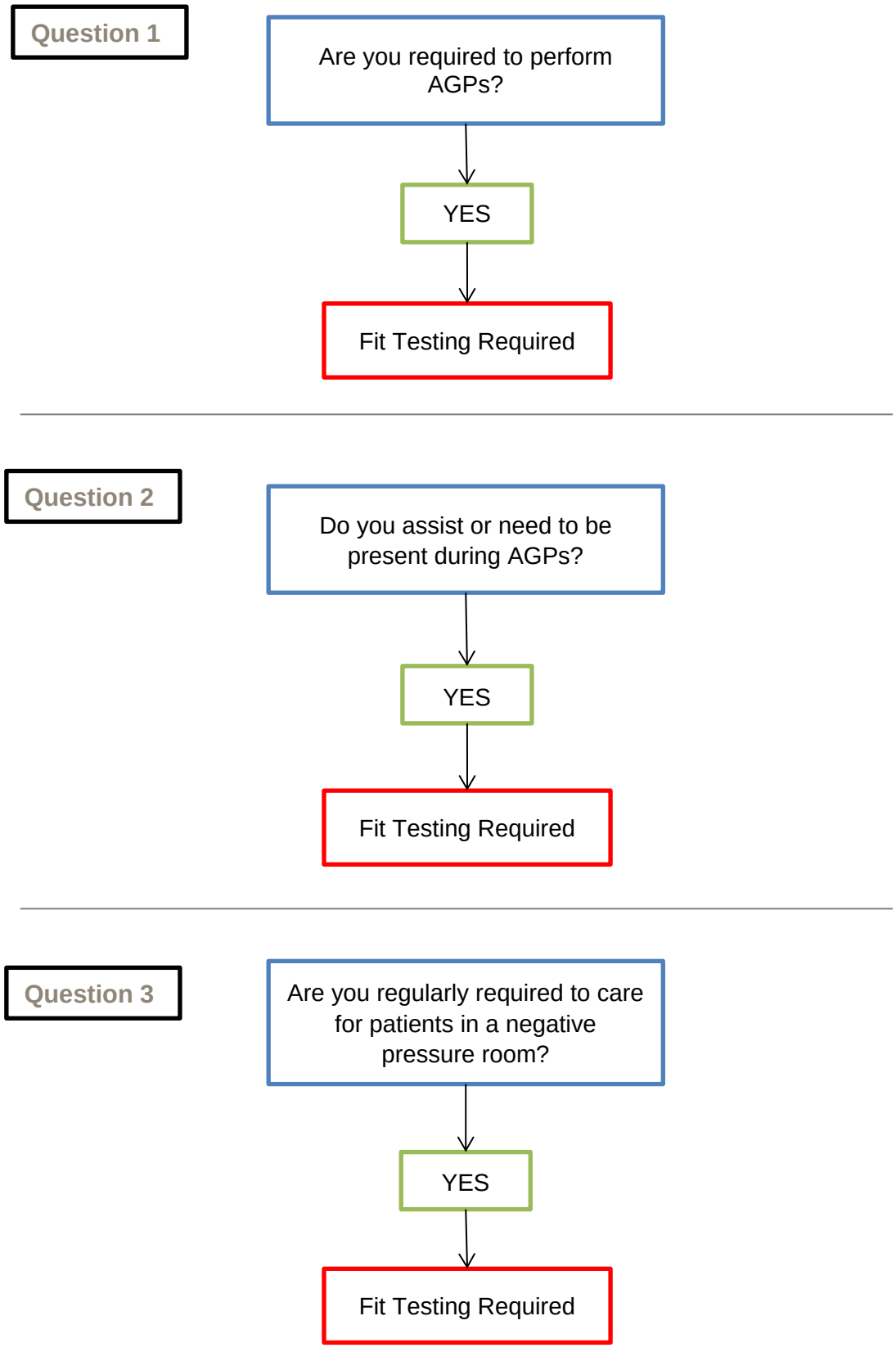
All other healthcare workers should be fit tested based on a risk assessment of the likelihood of caring for patients or having to enter the room of a patient with a known or suspected high morbidity/mortality airborne or respiratory infection.

Reducing Risk

To reduce the number of staff requiring fit testing the following strategies are recommended:

- Limit the number of people present during aerosol generating procedures
- Maintain staff immunisation rates and records

Flow chart: Risk assessment for P2 respirator fit testing



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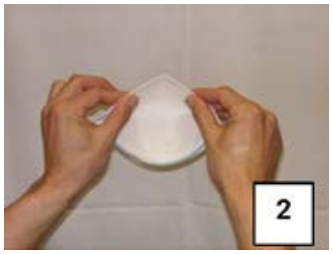
8. Standards Australia. AS/NZS 1716:2003 - Respiratory protective devices.

9. *Work Health and Safety Act 2012* (SA) http://www.legislation.sa.gov.au/LZ/C/A/WORK%20HEALTH%20AND%20SAFETY%20ACT%202012/CURRENT/2012.40.UN.PDF

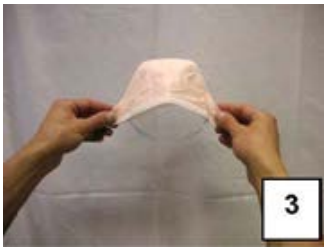
10. World Health Organization. Infection Prevention and control during health care for confirmed, probable or suspected cases of pandemic (H1N1) 2009 virus infection and influenza like illness. December 16th 2009. http://www.who.int/csr/resources/publications/swineflu/swineinfinfcont/en/index.html

Appendix 1: P2 respirator donning and fit checking

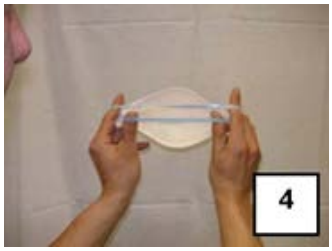
Separate the edges of the respirator to fully open it



Slightly bend the nose wire to form a gentle curve



Hold the respirator upside down to expose the two headbands



Using your index fingers and thumbs, separate the two headbands

Cup the respirator under your chin and pull headbands up and over your head

Place the lower headband at the base of your skull (under your ears)

Place the upper headband on the crown of your head. The band should run just above the top of the ears

Gently mould the nosepiece over the bridge of your nose by pressing down with fingers until it fits snugly

Don your eyewear and continue to adjust the respirator and edges until you feel you have achieved a good facial fit

Now it is time to do a **fit check**.

1. Gently inhale. When you breathe in, the respirator should draw in slightly towards the face
2. Gently exhale. The respirator should fill up with air. It is important at this stage that there is **NO** air leakage around the edges of the respirator

A fit check should be done each time a P2 respirator is worn.

If you have not achieved a successful fit as instructed above it is important that you seek advice or have someone assist you with fitting and checking your respirator.

An incorrectly fitted respirator will not provide you with the intended level of protection.