This purpose of this Information Circular is to advise Western Australian (WA) healthcare facilities (HCFs) of the recommendations for fit testing and fit checking by wearers of particulate filter respirators (masks) that were endorsed by the Healthcare Infection Council of Western Australia (HICWA) Executive Committee on 26 November 2012. Relevant explanatory information on this topic is also provided.

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This information is available in alternative formats upon a request from a person with a disability.
1. INTRODUCTION

Healthcare workers (HCWs) are potentially at risk of exposure to infectious agents when patients are confirmed or suspected of having a disease that is transmitted by the airborne route. The implementation of standard and transmission-based airborne precautions is required to minimise this risk and includes the use of particulate filter masks (designated as P2 or N95 respirators) as part of the personal protective equipment (PPE) that HCWs are required to wear.\(^1\)

In order for a respirator to offer the maximum desired protection, it is essential that there is a correct facial fit i.e. tight seal between the respirator and the wearer’s face. The two distinct procedures used to achieve this are referred to as the ‘fit test’ and the ‘fit check’.

The Australian Guidelines for the Prevention and Control of Infection in Healthcare (2010) state that fit testing should be performed for employees working in clinical areas where there is a significant risk of exposure to infectious agents transmitted via the airborne route. It also states that fit testing should be performed on commencement of employment, annually and when there is a significant change in the wearer’s facial characteristics that could alter the facial seal of the respirator such as significant change in body weight or facial surgery. Fit checking must be performed every time a HCW puts on a respirator.\(^1\)

The implementation of fit testing of HCWs is resource intensive in terms of time, labour and costs and there is currently a lack of scientific evidence to support the practice. The issues surrounding fit testing were reviewed by the Healthcare Infection Council of Western Australia (HICWA) Executive Committee in November 2012. This review included a cost analysis for the implementation of fit testing for high-risk groups in the South Metropolitan Health Service (SMHS) and resulted in recommendations specifically for WA HCFs.

2. AIRBORNE TRANSMISSION

Airborne transmission occurs when a susceptible host inhales infectious airborne agents contained in small particle aerosols (<5 microns), that remain suspended in the air for long periods of time and are widely dispersed by air currents. There is a risk to HCWs when:

- a patient is confirmed or suspected of having a disease that is transmitted by the airborne route, such as severe acute respiratory syndrome (SARS), pulmonary or laryngeal tuberculosis (TB), extra-pulmonary TB where there is a discharging lesion,\(^2\) measles (measles virus), or chickenpox (varicella-zoster virus)

- aerosol-generating procedures (AGPs) are performed on patients with infectious respiratory disease as they promote the generation of small particle aerosols. To reduce the risk of airborne transmission, the performance of AGPs on these patients should be limited unless medically indicated. AGPs include: positive pressure ventilation (via mask), high frequency oscillatory ventilation, diagnostic sputum induction, nebulisation of medication, airway suctioning, bronchoscopy, and endotracheal intubation.\(^1,3,4\)

- a novel influenza or respiratory virus emerges that causes acute respiratory illness. In this event, there may be a risk of airborne transmission to HCWs, necessitating the need for airborne precautions, and/or higher respiratory protection, until the characteristics of the microorganism (e.g. the mode of transmission, transmissibility, infectivity and related mortality) are confirmed by public health authorities.\(^3\)

Influenza and other viruses that cause respiratory disease are transmitted, in the main, by large respiratory droplets (>5 microns) and airborne transmission is considered to be a less likely mode of transmission, unless AGPs are performed. In WA HCFs, the implementation of standard and droplet precautions (with surgical masks) are recommended for influenza-
like illnesses (ILI) unless an AGP is performed (either P2 or N95 respirator required), as outlined in OD 0294/10 Infection Prevention and Control of Influenza-Like Illness in Western Australian Healthcare Facilities. 

3. RESPIRATORS

When there is a high probability of airborne transmission, scientific principles support the use of respirators that filter at least 94 percent of 0.3 micron particles (the most penetrable size) from the air. Both P2 and N95 respirators are considered appropriate for use with airborne precautions in Australian HCFs. 

P2 respirators are those that comply with the Australian Standard AS/NZS 1716: 2012. Respiratory Protective Devices.

N95 respirators are those that are approved and certified as such by the United States National Institute for Occupational Safety and Health (NIOSH).

4. FIT TESTING AND FIT CHECKING

4.1 Fit testing

Fit testing is performed to determine whether a specific type, model and size of respirator is a suitable fit for an individual and that it is worn correctly to achieve a facial seal.

Fit testing may use quantitative or qualitative methods:

- quantitative methods use electronic equipment that measures air leakage into the respirator
- qualitative methods use a hood and an odour or taste solution to determine the ability of the respirator wearer to smell or taste the test agent.

4.2 Fit checking

Fit checking describes the process that HCWs perform 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 that there are no gaps between the respirator and face.

The procedure for performing a fit check (user-seal check) is outlined in Appendix 1.

5. RECOMMENDATIONS

The HICWA Executive concluded that the implementation of mandatory fit testing for HCWs in WA HCFs was not supported in view of insufficient evidence of its efficacy and the large financial and human resources required for implementation. This position will be re-examined following review of the evidence for fit testing at the national level.

In the interim, HICWA Executive endorsed the following recommendations for WA HCFs.

- P2 or N95 respirators are required for HCW use where there is a high probability of airborne transmission (refer section 2).

- The fit check procedure is the appropriate minimum standard for HCWs using P2 and N95 respirators and must be performed every time a respirator is donned.

- HCFs should ensure HCWs receive appropriate training on donning and performing a fit check for all types of P2 and N95 respirators available at the HCF.
• HCFs should take a risk-management approach to identify HCWs in high-risk settings for priority training e.g. intensive care units (ICU), emergency departments, respiratory and tuberculosis wards, physiotherapy departments.

• Where a HCW reports failure to achieve a seal following fit checking, and again after further training and assessment, an alternative size or style of mask must be sourced. HCWs who fail to achieve a seal following fit checking of alternative masks, should be excluded from caring for patients under airborne precautions.

• Implementation of fit testing is not mandatory but can be conducted at the discretion of each individual HCF following a risk-assessment for their facility and patient population.

6. REFERENCES


Fit checking a P2 or N95 respirator (mask)

The manufacturer’s instructions for proper wearing of a respirator and fit checking of individual brands and types of P2/N95 respirators should be referred to at all times.

Donning the respirator

- Prior to donning the respirator, check that it is not damaged.
- Follow the manufacturer’s instructions for donning the respirator.
- Conform the respirator to your face by pressing with your fingers across the bridge of the nose until it fits snugly.

Performing the fit check (commonly called the user-seal check)

- The fit check includes both positive and negative pressure seal checks and should be performed as per the specific manufacturer’s instructions for each type of respirator.
- Check the positive pressure seal of the respirator by exhaling. If the seal is good the respirator should bulge slightly when you exhale. If air escapes between your face and the respirator, you do NOT have a good facial seal. Readjust the respirator and repeat the fit check process.
- Check the negative pressure seal of the respirator by inhaling. The respirator should collapse slightly when you inhale. If the respirator is not drawn in towards the face or air leaks, you do NOT have a good facial seal. Readjust the respirator and repeat the fit check process.
- If you are unable to achieve a good facial seal do not proceed with your clinical activity. Possible reasons include:
  - the respirator has not been put on properly e.g. headbands are incorrectly positioned, hair or earrings are caught in the seal
  - glasses or face-shield are interfering with the seal (you do not have a seal if they fog)
  - the respirator is the incorrect size or type for your face
  - healthcare workers who have facial hair (including a 1–2 day beard growth) must be aware that an adequate seal cannot be guaranteed between the respirator and the wearer’s face.

- Speak to your supervisor if you cannot achieve a good facial seal after addressing the possible reasons listed. An alternative style or size of respirator may need to be sourced.

Resources

A PowerPoint presentation that demonstrates fit checking is available at: http://www.health.qld.gov.au/chrisp/resources/Fit_Check.ppt