



## Guidelines

# Guidance on the use of respiratory and facial protection equipment

J.E. Coia<sup>a,\*</sup>, L. Ritchie<sup>b</sup>, A. Adisesh<sup>c</sup>, C. Makison Booth<sup>c</sup>, C. Bradley<sup>d</sup>,  
D. Bunyan<sup>b</sup>, G. Carson<sup>e</sup>, C. Fry<sup>f</sup>, P. Hoffman<sup>g</sup>, D. Jenkins<sup>h</sup>, N. Phin<sup>g</sup>, B. Taylor<sup>i</sup>,  
J.S. Nguyen-Van-Tam<sup>j</sup>, M. Zuckerman<sup>k</sup>, The Healthcare Infection Society  
Working Group on Respiratory and Facial Protection

<sup>a</sup> Department of Clinical Microbiology, Glasgow Royal Infirmary, Glasgow, UK

<sup>b</sup> Health Protection Scotland, NHS National Services Scotland, Glasgow, UK

<sup>c</sup> Health & Safety Laboratory, Buxton, UK

<sup>d</sup> Hospital Infection Research Laboratory, University Hospital NHS Foundation Trust, Queen Elizabeth Hospital, Edgbaston, Birmingham, UK

<sup>e</sup> International Severe Acute Respiratory & Emerging Infection Consortium, Centre of Tropical Medicine, Nuffield Department of Medicine, Churchill Hospital, Oxford, UK

<sup>f</sup> Department of Health, London, UK

<sup>g</sup> Public Health England, Centre for Infections, London, UK

<sup>h</sup> Department of Clinical Microbiology, University Hospitals of Leicester NHS Trust, Leicester Royal Infirmary, Leicester, UK

<sup>i</sup> Intensive Care Society, London, UK

<sup>j</sup> Health Protection and Influenza Research Group, Division of Epidemiology and Public Health, City Hospital, Nottingham, UK

<sup>k</sup> South London Specialist Virology Centre, King's College Hospital NHS Foundation Trust, London, UK

## ARTICLE INFO

### Article history:

Received 12 April 2013

Accepted 13 June 2013

Available online 17 September 2013

### Keywords:

Respiratory infection

Facial protection equipment

Respiratory protection equipment

Personal protective equipment

Filtering face piece

Aerosol-generating procedure

Droplet transmission

Airborne transmission

## SUMMARY

Infectious micro-organisms may be transmitted by a variety of routes, and some may be spread by more than one route. Respiratory and facial protection is required for those organisms that are usually transmitted via the droplet/airborne route, or when airborne particles have been artificially created, such as during 'aerosol-generating procedures'. A range of personal protective equipment that provides different degrees of facial and respiratory protection is available. It is apparent from the recent experiences with severe acute respiratory syndrome and pandemic (H1N1) 2009 influenza that healthcare workers may have difficulty in choosing the correct type of facial and respiratory protection in any given clinical situation. To address this issue, the Scientific Development Committee of the Healthcare Infection Society established a short-life working group to develop guidance. The guidance is based upon a review of the literature, which is published separately, and expert consensus.

© 2013 The Healthcare Infection Society. Published by Elsevier Ltd. All rights reserved.

\* Corresponding author. Address: Department of Clinical Microbiology, Glasgow Royal Infirmary, 84 Castle Street, Glasgow G4 0SF, UK. Tel.: +44 141 211 4640.

E-mail addresses: [john.coia@nhs.net](mailto:john.coia@nhs.net), [john.coia@ggc.scot.nhs.uk](mailto:john.coia@ggc.scot.nhs.uk) (J.E. Coia).

## Key points

- Healthcare workers (HCWs) may have difficulty in deciding whether facial and respiratory protection is required, and in choosing which combination is appropriate in any given clinical situation. This document provides guidance to support HCWs to select appropriate respiratory and facial protection.
- Respiratory and facial protection as considered in this guidance is required to deal with the presence of potentially infectious particles in the air.
- A range of personal protective equipment (PPE) that provides facial and respiratory protection is available. In most clinical scenarios where this is required, it will comprise either a surgical mask or a respirator, with or without eye protection.
- The requirement to wear respiratory and facial protection will be determined by a range of factors that involve a risk-assessment-based approach related to: the procedure/task to be undertaken; known/suspected infection; and presenting patient symptoms.
- The selection and use of respiratory and facial protection equipment must be underpinned by appropriate staff education and training.
- Specific recommendations on selection of equipment based upon this approach are presented in detail within the main body of the document.
- In the majority of situations where respiratory and facial protection is required, a surgical mask will be adequate. For a very small number of pathogens that are truly transmissible via the airborne route, or where aerosol-generating procedures (AGPs) involving infectious body fluids are being undertaken, a respirator will be required. The requirement for eye protection will largely be determined by the risk of splashing/spraying of blood and/or body fluids to the eyes/face.
- Recommendations for future research to address outstanding evidence gaps are provided.

## Introduction

A range of PPE that provides different degrees of facial and respiratory protection is available. This includes surgical face masks, respiratory protection equipment (RPE), protective spectacles, goggles and visors. It is apparent from recent experiences with severe acute respiratory syndrome and pandemic (H1N1) 2009 influenza that HCWs may have difficulty in choosing the correct type of facial and respiratory protection in any given clinical situation.<sup>1,2</sup>

To address this issue, the Scientific Development Committee of the Healthcare Infection Society established a short-life working group in May 2011 to develop appropriate guidance. The working group included representation from the Healthcare Infection Society, Public Health England, Health and Safety Executive (HSE), Association of National Health Occupational Physicians, Health Protection Scotland, Infection Prevention Society, Intensive Care Society, Clinical Virology Network and British Infection Association. The guidance is based upon a review of the literature (which can be accessed separately) and expert consensus.<sup>3</sup> Although the guidance also takes account of relevant current UK health and safety

legislation, the majority of the material will be more widely relevant.

Implementation of this guidance is a matter for local determination based on risk assessment and the need to adhere to any relevant health and safety legislation. Employers in the UK have a duty of care to their employees to provide a safe working environment, which may include the provision and use of PPE (see [Appendix 3](#)).

## Aim

This article provides guidance (best practice guidelines) to support HCWs in hospital or community settings to select and wear the appropriate respiratory and facial protection to minimize the risk of acquisition of infection in the workplace.

## Exclusions

This guidance does not cover the use of powered respirators, chemical exposures and laser plumes, or Category 4 pathogens. Recommendations on the latter are available from the Advisory Committee on Dangerous Pathogens<sup>4</sup> and the HSE document 'Respiratory protective equipment at work: a practical guide'.<sup>5</sup>

Advice on the wearing of respiratory and facial protection by patients and visitors is also out with the scope of the current guidance.

## Risks associated with infectious particles and routes of transmission

The respiratory and facial protection considered in this guidance is required to deal with the presence of infectious particles in the air. These particles form a continuous spectrum of sizes and resultant properties. The size of the particle determines the microbial numbers it can carry, the distance it can travel, how deeply it can penetrate the host's respiratory tract, and what form of protection will be necessary.

For convenience, particles can be grouped into functional units categorized by their routes of transmission.

- Splashes: large particles (>100 µm in diameter) that fall out of airborne suspension within a few seconds.
- Droplets: smaller particles but larger than aerosols (approximately 5–100 µm in diameter). While the lower range of these particle sizes (<20 µm) will remain airborne for many minutes, particles >20 µm fall out of airborne suspension within seconds. Droplet particles penetrate the respiratory tract to above the alveolar level. However, if a liquid (aqueous) droplet evaporates before falling to the ground, it can shrink to become an aerosol particle known as a 'droplet nucleus'.

Splash and droplet transmission occurs as a result of droplets being expelled from the respiratory tract of an infected individual (e.g. during coughing and sneezing). These may impact directly on to a mucosal surface or conjunctiva of a susceptible individual. Such transmission tends to be relatively efficient (large particles can contain high numbers of microbes), but is only effective over the short distance before these particles fall out of the air.

Download English Version:

<https://daneshyari.com/en/article/3371614>

Download Persian Version:

<https://daneshyari.com/article/3371614>

[Daneshyari.com](https://daneshyari.com)