Infection prevention and control recommendations for the use of Personal Protective Equipment (PPE)

V3. 21.08.2024

Version	Date	Changes from previous version	Drafted by
3	21.08.2024	Significant restructuring of the document to support ease of use. General revision and editorial updates throughout the guidance document. The scope of this guidance has changed from COVID-19 specific recommendations for PPE use to a more generic approach on the infection prevention and control aspects of PPE Content throughout the document has been removed and direction has been provided to specific sections in the National Clinical Guidance No. 30 Infection Prevention and Control Removal of duplicated content from various sections throughout the document Removal of recommendations including vaccination Removal of COVID-19 and immunity after recovery Addition of section towards environmentally sustainable PPE Adaption of risk assessment for the use of PPE Removal of Table on the recommendations for the use of PPE during COVID-19 pandemic Inclusion of table on balancing PPE use with sustainability and health & safety aspects Inclusion of links to new poster resources including “putting on and taking off PPE and “Gloves Off” poster Removal of changes prior to 31.03.23 in this table.	AMRIC
2.9	31.03.2023	Risk assessment for PPE for AGPs where COVID 19 is not suspected/confirmed. Addition of point of care risk assessment (PCRA) prior to performing a clinical care task, to inform the level of IPC precautions needed including the choice of appropriate PPE Change in terminology from COVID-19 to COVID-19/respiratory viral infection	AMRIC

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Introduction

This is a stand-alone guidance document that contains specific detail on the management of personal protective equipment (PPE). Core elements of infection prevention and control (IPC) are contained within the Department of Health (2023) NCEC National Clinical Guideline No. 30 Infection Prevention and Control, available at: https://www.gov.ie/IPCclinicalguideline and this guidance should be read and interpreted in conjunction with the national guidance document. This guidance applies to all areas where health and social care is delivered.

Infection prevention and control practices supported by appropriate use of PPE are important to minimise the risk to patients[1] of acquiring a healthcare associated infection. These measures are equally important in controlling exposure to occupational infections for health and care workers (H&CWs). Traditionally, a hierarchy of controls has been used. The hierarchy ranks controls according to their reliability and effectiveness and includes engineering controls, administrative controls, and ends with personal protective equipment (PPE).

PPE refers to a variety of barriers, used alone or in combination, to protect mucous membranes, airways, skin and clothing from contact with infectious microorganisms. PPE used as part of standard precautions includes aprons, gowns, gloves, surgical masks, protective eyewear and face shields. Selection of PPE is based on the type of interaction with the person cared for, known or possible infectious microorganisms and the likely mode of transmission of those microorganisms. PPE also protects from exposure to infectious microorganisms in the surrounding environment that may be transferred to the person by healthcare workers. Personal protective equipment (PPE) is an important element in protecting healthcare workers from hazardous substances and, as outlined in the Safety Health and Welfare at Work Act 2005, employers must supply PPE where risks cannot be eliminated or adequately controlled. PPE supplies should be readily available, stored in a clean dry area and within their expiry date.

On occasion, patients may be advised/requested to put on PPE in a healthcare setting, following a point of care risk assessment (PCRA). This is for their own protection and/or the protection of others.

Towards Environmentally Sustainable Personal Protective Equipment

The COVID-19 pandemic highlighted the important role of personal protective equipment (PPE) in protecting individuals from the transmission of the virus. However, the rapid increase in PPE production and consumption has also raised concerns about its environmental impact. As previously stated, PPE is essential to protect healthcare workers from hazardous substances, however, employers must supply PPE where risks cannot be eliminated or adequately controlled. Delivering sustainable healthcare requires us to use resources wisely, so we can meet the health needs of future generations and preserve the environment.

Healthcare providers must be cognisant of the use and disposal of PPE in the context of

[1] Where the term patient is used throughout this guidance document, it refers to patients, service users, clients, residents, person, supported individual

promoting sustainability within the health service. PPE must meet appropriate European standards, relevant health and safety standards and should be used in accordance with best practice national IPC Guidance and a Point of care risk assessment (PCRA) which informs appropriate use and in line with manufacturers' recommendations.

Every effort should be made to reduce the amount of PPE generated at source. Whilst recognising that the majority of PPE that is currently available is designated as single use, environmental aspects and sustainability should be considered.

Raising awareness among PPE users (health & social care workers and members of the public) about the environmental impact of their choices is vital. Education campaigns can help individuals understand the importance of using reusable or sustainable alternatives whenever possible.

Encouraging responsible and appropriate PPE use, proper disposal, and recycling, where this is possible, can empower users to make informed decisions that align with their commitment to sustainability.

There are a number of ways to promote and support sustainability in relation to PPE use and some are set out here:

1. Promote the use of PPE as the last line of defence in the hierarchy of controls
2. Behavioural aspects can influence the choice of PPE. Conducting a point of care risk assessment (PCRA) will support selection of PPE for every task to avoid overuse. Positive healthcare role modelling will further enhance this aspect of PPE selection and encourage best practice. See next section for further detail on point of care risk assessment
3. Appropriate segregation and disposal of PPE is crucial to minimise the environmental impact of disposal of used PPE and supports healthcare providers to operate more sustainably. The amount of healthcare risk waste can be reduced by correct segregation of healthcare risk waste and non-risk waste. This can be achieved through the correct placement of healthcare risk and non-risk waste bins and promotes appropriate segregation and disposal of PPE into the correct waste streams in line with HSE waste management policies and guidance
4. Healthcare risk waste is (HCRW) is any waste that poses a risk due to its potential infectious nature and includes items contaminated with blood or body fluids, contaminated waste from patients with transmissible infectious diseases and other healthcare infectious waste. Ensure PPE waste is segregated and disposed of as per local waste management policies. Regardless of where waste is generated (for example from isolation rooms versus routine patient care areas) the principles of determining whether it is to be treated as healthcare risk waste or non-risk waste remain the same for more information see https://www.hse.ie/eng/about/who/healthbusinessservices/national-health-sustainability-office/files/best-practice-guide-on-healthcare-risk-waste-reduction.pdf
5. Avoid overstocking PPE supplies to reduce disposal of items that have past their expiry date

6. Emphasis is on the importance of using simple measures for example, performing hand hygiene instead of wearing gloves where appropriate. Promote the message that "gloves are not a substitute for hand hygiene" and raise awareness about the risks of over-reliance on gloves
7. Other elements which focus on decision making in the context of sustainable use of PPE should be promoted
8. All PPE must meet appropriate standards. PPE should also be used in accordance with manufacturers' recommendations.

See Appendix 1, Balancing PPE use with health & safety aspects for further detail.

Risk assessment for the appropriate use of PPE

Selection of PPE must be based on assessment of the risk of transmission of infectious microorganisms to the person cared for or healthcare worker and the risk of contamination of the clothing or skin of healthcare workers or other staff by patients' blood, body substances, secretions or excretions. PPE is always recommended for use in addition to hand hygiene and not as a substitute for hand hygiene.

PPE should generally:

1. be used only when required by the task being undertaken (avoid "ritual" use of PPE)
2. be appropriate to the task being undertaken
3. be worn for a single procedure or episode of patient care where contamination with body substances is likely
4. be removed in the area where the episode of patient care takes place (with the exception of masks which should be removed promptly after leaving the area within which the protection of a mask is required).

Note: In the context of a pandemic or other exceptional event, continued use of certain items of PPE when seeing a number of patients with the same infectious disease in direct succession in one clinical area may be acceptable based on a risk assessment. This may apply to mask, face protection, apron and gowns if the task performed by the healthcare worker does not bring the item of PPE into physical contact with the person cared for and the item of PPE remains visibly clean and intact. The same pair of gloves must not be used when caring for multiple people.

When providing care in the context of a pandemic or other exceptional events, staff should refer to relevant national infection prevention and control guidance for advice on the PPE to be worn.

As part of standard and transmission based precautions, it is the responsibility of every H&CW to undertake a point of care risk assessment (PCRA) PRIOR to performing a clinical care task, as this will inform the level of IPC precautions needed, including the choice of appropriate PPE, as required.

For further information on PCRA and how to use a PCRA please see below links:

https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/posters/PCRAResistPoster.pdf

https://www.hse.ie/eng/about/who/healthwellbeing/our-priority-programmes/hcai/resources/general/how-to-use-a-point-of-care-risk-assessment-pcra-for-infection-prevention-and-control-copy.pdf

Sequences and procedures for putting on and removing PPE

To reduce the risk of transmission of infectious microorganisms, PPE must be used appropriately. The sequence for putting on and removing PPE is important in ensuring that PPE is fitted correctly and to prevent the risk of contamination when removing.

The sequence of putting on PPE is illustrated on the link below:

https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/posters/HSE%20West%20Putting%20On%20PPE%20A4%20Poster%20ver%202%20PROOF.pdf

The sequence of removing PPE is illustrated on the link below:

https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/posters/HSE%20West%20Taking%20Off%20PPE%20A4%20Poster%20ver%202%20PROOF.pdf

Further AMRIC training resources including PPE can be accessed via the AMRIC Hub at https://www.hseland.ie

Types of PPE

1. **Gloves:** All gloves are disposable, single-use items. Gloves can be made of latex or non-latex material such as nitrile. Nitrile gloves are used routinely in the HSE to avoid risks associated with latex hypersensitivity. Gloves should be powder free. Vinyl gloves should not be used unless there are no acceptable alternatives as they are prone to leakage and tearing. Polythene i.e. plastic gloves are not suitable for clinical use. Gloves are not required for most healthcare interactions, but should be worn where there is a risk to the H&CW of contact with blood or body fluids of a patient / or as per other indications for glove use as indicated in the safe use of gloves poster
2. Supportive poster resources are available on the following links:
   "Gloves Off" poster:
   https://www.hpsc.ie/a-z/microbiologyantimicrobialresistance/infectioncontrolandhai/posters/HSE%20AMRIC%20Gloves%20Off%20Poster%202024.pdf
   "Safe use of gloves"
   https://www.hpsc.ie/a-

z/respiratory/coronavirus/novelcoronavirus/guidance/infectionpreventionandcontrolguidance/ppe/HSE%20Safe%20Gloves%20Wear%20Poster%202022%20-%20Screen.pdf

3. **Disposable plastic aprons:** are recommended to protect staff uniforms and clothes from contamination when providing direct patient care and when carrying out environmental and equipment decontamination. Disposable plastic aprons are suitable for low contact activity
4. **Fluid resistant gowns:** are recommended when there is a risk of extensive splashing of blood and or other body fluids. A disposable plastic apron does not provide adequate cover to protect H&CWs uniform or clothing
5. If **non-fluid resistant gowns** are used and there is a risk of splashing with blood or other body fluids a disposable plastic apron should be worn underneath or over the gown
6. **Eye protection/ Face visor:** provide eye protection from splashes, sprays and respiratory droplets from multiple angles. The mucous membranes of the mouth, nose and eyes are portals of entry for infectious microorganisms, as are skin surfaces if skin integrity is compromised. Eye protection should be worn when exposed to risk of contamination to the eyes from splashing of blood, body fluids, excretions or secretions (including respiratory secretions). The following eye protection should be used:
    a. Full face shield or visor
    b. Goggles / safety spectacles
7. **Surgical Face Masks**: The terms surgical mask, medical mask and medical grade mask are widely used and are interchangeable; the term surgical mask is used in this guidance document. Surgical masks are loose fitting, single use items that cover the nose and mouth. They are used as part of standard precautions to keep splashes or sprays from reaching the mouth and nose of the person wearing them. They also provide some protection from respiratory secretions and are worn when caring for patients on droplet precautions. People who are coughing or known to be infectious can be asked to wear a mask to limit potential dissemination of infectious respiratory secretions from the patient to others. Two types of surgical mask are in use for healthcare staff (Type IIR or Type II). Both masks have the same bacterial filtration rate of 98%. Type IIR masks are more appropriate in situations where there is a high risk of splashing by bodily fluids for example in the operating theatre, critical care unit and emergency department setting where a patient's condition may be unstable or acutely deteriorating.
    a. Considerations when using a surgical mask include:
    - masks should be changed when they become soiled or wet and disposed of immediately after use
    - masks should never be reapplied after they have been removed
    - masks should not be left dangling around the neck
    - touching the front of the mask while wearing it should be avoided
    - hand hygiene should be performed upon touching or discarding a used mask
    - masks should normally be changed between episodes of care for different people; however, continued use of a mask while moving between people

may be justified by risk assessment in the context of an outbreak or pandemic provided the mask is clean, dry and undamaged

Link to safe use of masks poster resources are available on the following link: https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/infectionpreventionandcontrolguidance/ppe/HSE%20Safe%20Gloves%20Wear%20Poster%202022%20-%20Screen.pdf

8. **Respirator masks**: Respirator masks are designed to help reduce exposure of the wearer's airway to airborne contaminants such as particles, gases or vapours.
   It is good practice to wear correctly fitting and fit checked respiratory protection (FFP2 respirator) when entering the patient-care area where an airborne-transmissible infectious microorganism is known or suspected to be present, and when entering the patient care area where Aerosol Generating Procedures (AGPs) associated with an increased risk of infection are performed on people with known or suspected infectious microorganisms normally transmitted by the droplet route.

   Sound scientific principles support the use of fit-tested and fit-checked FFP2 respirators to prevent airborne transmission.

Tips for respirator facemasks:
The wearer must undertake a fit check each time a respirator is worn, to ensure there are no gaps between the mask and face for unfiltered air to enter;
Respirator masks can remain effective when worn continuously for extended periods of time, but must be changed if wet or damaged and once removed they should be disposed of and not re-used.
Check to determine if respirator masks are fluid repellent. If respirator masks are not fluid repellent, additional protection, such as a visor, is required in situations where there is a splash risk.
Poster resources are available on the "Safe use of FFP2 respirator mask" https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/infectionpreventionandcontrolguidance/ppe/FFP2%20Masks%20Poster.final.pdf

Valved Respirator masks

1. Valved respirator masks should generally not be used. The purpose of a respirator's exhalation valve is to reduce the breathing resistance during exhalation. The valve is designed to open during exhalation to allow exhaled air to exit the respirator and then close tightly during inhalation, so inhaled air is not permitted to enter the respirator through the valve. A person who may have respiratory infections such as COVID-19, influenza, pulmonary *Mycobacterium tuberculosis* (TB) or respiratory syncytial virus (RSV) should not wear a valved respirator, because there is a possibility that exhaled particles may leave the respirator via the valve and enter the surrounding environment.
2. A UK NHS Patient Safety Alert has highlighted the risk of the use of valved respirator masks in the operating theatre environment, where the unfiltered exhaled air of the wearer can contaminate the surgical field and result in serious infections.

Fit testing

The Health and Safety Authority indicate that where a risk assessment indicates that H&CWs need to use a close-fitting respirator mask for their protection that every effort should be made to comply with the requirement for fit testing of the worker, as far as is reasonably practicable. When fit testing of all staff is not immediately possible, then fit testing should be prioritised for those at greatest risk. Priority groups for fit testing include the following:

1. H&CWs most likely to be involved in performing AGPs, in particular endotracheal intubation
2. H&CWs most likely to have the most prolonged exposure to infections such as respiratory viral infections outlined above in settings where AGPs are performed.

Advice on fit checking and fit testing is available on the AMRIC PPE module on www.hseland.ie and NCEC National Clinical Guideline No. 30 Infection Prevention and Control, available at: https://www.gov.ie/IPCclinicalguideline Volume 1, Section 3, No. 3.2.4, Recommendation 16 pages 98-101

Extended use of PPE

Extended use means that certain items of PPE (gown, apron, face mask, eye protection) may be used while attending to a series of patients with the same infection in succession in a single period of clinical activity in one ward or unit.

Extended use of PPE is not generally recommended or required.

Extended use of PPE to limit use of PPE is not required when PPE supplies are sufficient. Extended PPE use however, may be required for practical reasons when working in a high risk area where repeated change of certain items of PPE (for example mask and eye protection) may be impractical. In the context of a pandemic or other exceptional event, continued use of certain items of PPE when seeing a number of patients with the same infectious disease in direct succession in one clinical area may be acceptable based on a risk assessment. Gowns, if worn, should normally be changed between patients and after completion of a procedure or task.

However, if necessary to cope with workload:

1. (A) For low contact activities, a disposable apron is appropriate rather than extended use of gowns in cohort areas with a confirmed infectious disease
   (B) Where H&CWs are engaged in high contact activities then gowns should be changed between patients, to minimise risk of cross-transmission of other pathogens commonly encountered in healthcare settings (e.g., antimicrobial resistant organisms, such as CPE, MRSA, VRE or *C. difficile*)
2. If PPE is wet, soiled or torn it must be taken off and disposed of

3. It is not appropriate to wear PPE that was used in the care of patients with an infectious microorganism when moving between wards or units or when working in designated office spaces or in break areas on the ward or unit
4. Gloves are not required for all interactions with patients; consider their use in the first instance and if the task can be performed safely following a PCRA and hand hygiene performed as per WHO 5 moments. If gloves are worn, they must be changed and hand hygiene performed between patients and as required between different care activities on the same patient. Extended use of gloves is not appropriate. Refer to the NCEC National Clinical Guideline No. 30 Infection Prevention and Control, available at: https://www.gov.ie/IPCclinicalguideline,
   Volume 1, section 2, No. 2.1.15 Involving people who use healthcare services in their care, page 29
   Volume 1, Section 3, Recommendation 17, page 104.
   Volume 1, Section 3, Recommendation 19, page 108-111
   Volume 1, Section 3, Table 18, page 110

Additional information on PPE is available in the NCEC National Clinical Guideline No. 30 Infection Prevention and Control, available at: https://www.gov.ie/IPCclinicalguideline, Volume 1, Table 18, page 110

Appendix 1 Balancing PPE use with sustainability and health & safety aspects

Finding a balance between providing adequate H&CW protection and promoting sustainability is an important consideration**.**

PPE	Use	Rationale for single use	Balancing sustainability with health & safety aspects
Gloves	Single use	Gloves are single-use items; glove decontamination and reprocessing are not recommended and should be avoided No standardised, validated and affordable procedure for safe glove reprocessing May have biohazardous materials or chemicals on them so cannot be recycled or reused Extended use of gloves is not appropriate	Perform a PCRA and only use when appropriate to the task undertaken Appropriate segregation and disposal The unnecessary and inappropriate use of gloves results in a waste of resource and may increase the risk of transmission of infection
Apron	Single-use, for one procedure or episode of patient care	Aprons are single use and should be changed between caring for different people May have biohazardous materials or chemicals on them so cannot be recycled or reused	Perform a PCRA and only use when appropriate to the task undertaken Appropriate segregation and disposal The unnecessary and inappropriate use of plastic aprons results in a waste of resource and may increase the risk of transmission of infection Consider other suitable environmentally sustainable options where available through procurement - Product Performance testing if biodegradable • EN 13432, • ASTM D6400 or alternative equivalent set of standards Extended use of certain items of PPE for example, apron, may be appropriate while attending to a series of patients with the same infection in succession in a single period of clinical activity in one ward or unit

PPE	Use	Rationale for single use	Balancing sustainability with health & safety aspects
			Extended PPE use may be required for practical reasons when working in a high risk area where repeated change of certain items of PPE may be impractical
Gown	Single use	Sterile gown worn for procedures that require an aseptic field should be disposed after use Gowns should be changed between caring for different people May have biohazardous materials or chemicals on them	Performing a PCRA and only use when appropriate to the task undertaken Appropriate segregation and disposal The unnecessary and inappropriate use of gowns results in a waste of resources and may increase the risk of germ transmission Fluid impervious. Single-use and disposable or reusable after reprocessing.
	Extended use	Gowns, if worn, should normally be changed between patients and after completion of a procedure or task. However: a. For low contact activities, a disposable apron is appropriate rather than extended use of gowns in cohort areas b. Where H&CW are engaged in high contact activities, then gowns should be changed between patients, to minimise risk of cross-transmission of other pathogens commonly encountered in healthcare settings (e.g., antimicrobial resistant organisms, such as CPE, MRSA, VRE or *C. difficile*).	Extended use of certain items of PPE such as a gown, may be appropriate while attending to a series of patients with the same infection in succession in a single period of clinical activity in one ward or unit Extended PPE use may be required for practical reasons when working in a high risk area where repeated change of certain items of PPE may be impractical
Eye protection	Single use/ Single person use/ as per manufacturer's instructions	As per manufacturer's instructions	Perform a PCRA and only use when appropriate to the task undertaken Appropriate segregation and disposal Reusable face shields and protective eyewear should be cleaned according to the manufacturer's instructions, generally with detergent solution, and

PPE	Use	Rationale for single use	Balancing sustainability with health & safety aspects
			be completely dry before being stored. If they are to be disinfected they should be disinfected using either an appropriate disinfectant or heat. Reusable eye protection is H&CW specific Extended use of certain items of PPE for example, eye protection may be appropriate while attending to a series of patients with the same infection in succession in a single period of clinical activity in one ward or unit Extended PPE use may be required for practical reasons when working in a high risk area where repeated change of certain items of PPE (for example mask and eye protection) may be impractical
Mask	Single use	May have biohazardous materials or chemicals on them so cannot be recycled or reused Manufacturer's instruction on length of filtration for respirator masks Masks should not be reapplied after removal	Masks should be changed between episodes of care for different people. Continued use of a mask while moving between people may be justified by risk assessment in the context of an outbreak or pandemic, provided the mask is clean, dry and undamaged Extended use of a mask may be appropriate while attending to a series of patients with the same infection in succession in a single period of clinical activity in one ward or unit. Extended mask use may be required for practical reasons when working in a high risk area where repeated change of certain items of PPE may be impractical

Appendix 2 References and Bibliography

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