

Standard Infection Control Precautions and Transmission Based Precautions Literature Review: Personal Protective Equipment (PPE) Eye/Face protection

Version 1.0

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Version History

This literature review will be updated in real time if any significant changes are found in the professional literature or from national guidance/policy.

Version	Date	Summary of changes
1.0	August 2020	Updated using 2 person systematic methodology with findings divided into two parts - SICP and TBP recommendations.

Approvals

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1.0	August 2020	National Policies, Guidance and Outbreaks Steering Group

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Description:	This literature review examines the available professional literature on PPE (Eye/Face Protection) in the hospital setting.
Purpose:	To inform the Standard Infection Control Precaution (SICPs) and Transmission Based Precautions Policy section on PPE (eye/face protection) in the National Infection Prevention and Control Manual in order to facilitate the prevention and control of healthcare associated infections in NHS Scotland hospital settings.
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Contents

1	Objectives	6
2	Methodology	7
3	Discussion	7
3.1	Implications for practice: SICPs	7
3.2	Implications for practice TBPs.....	13
3.3	Implications for research	14
4	Recommendations	15
4.1	Recommendations for SICPs	15
4.2	Recommendations for TBPs	20
	References.....	21
	Appendix 1: Standards pertaining to eye/face protection as PPE	27
	Appendix 2: Grading of recommendations	29

1 Objectives

The aim of this review is to examine the extant professional literature regarding the use of eye/face wear as Personal Protective Equipment (PPE) for standard infection control purposes.

The specific objectives of the review in terms of SICPs are to determine:

- Are there any legislative requirements for the use of eye/face protection as PPE for infection control purposes?
- When/where should eye/face protection be used for SICPs?
- What type(s) of eye/face protection should be used for SICPs?
- When should eye/face protection be removed/changed?
- How should eye/face protection be donned?
- How should eye/face protection be doffed?
- How should eye/face protection be reprocessed/disposed of?
- How should reusable eye/face protection be decontaminated?
- How should eye/face protection be stored?
- The specific objectives of the review in terms of TBPs are to determine:
 - When/where should eye/face protection be used for TBPs?
 - What type of eye/face protection should be used for TBPs?

N.B. This review did not assess the use of eye/face wear in non-clinical settings where there may be a health and safety requirement for their use, for example, in estates and facilities.

2 Methodology

This targeted literature review was produced using a defined two-person, systematic methodology as described in the National Infection Prevention and Control Manual: Development Process.

3 Discussion

3.1 Implications for practice: SICPs

Are there any legislative requirements for the use of eye/face protection as PPE for infection control purposes?

There are no specific legislative requirements regarding the use of surgical masks as PPE or medical devices for infection control purposes, that is, to prevent the spread of healthcare associated infection. However, UK legislation does require employers to provide PPE that affords adequate protection against the risks associated with the task being undertaken.¹ Employers have a responsibility to provide clear instruction and information on how to use provided PPE and healthcare workers (HCWs) have a responsibility to ensure that suitable PPE is worn correctly for the task being undertaken.¹ In addition, if multiple pieces of PPE are required the employer shall make sure that the pieces are compatible with each other and in wearing them together, do not reduce the level of protection.² The wearing of PPE is covered by the Health and Safety at Work Act (1974), Control of Substances Hazardous to Health 2002 (as amended) regulations, and the Personal Protective Equipment at Work Regulations 1992 (as amended).¹⁻³

The Health and Safety at Work etc. Act 1974 is the generic health and safety legislation for the UK and broadly covers the use of PPE and risk, but is not health and care setting specific.¹ The Control of Substances Hazardous to Health (COSHH) is more specific and provides details in relation to hazardous materials and the use of PPE; and can almost be viewed as a detailed schedule of the Health and Safety at Work Act, which would include pathogens in the hospital environment and the use of appropriate PPE – for example the use of gloves to protect against blood borne viruses during venepuncture.³ If an activity does not involve or is perceived not to involve contact with a hazardous material then the Personal Protective Equipment at Work Regulations 1992 provide general guidance on the use of PPE; in the health and care environment this could be the use of gloves to protect against glass fragments when cleaning up broken glass;² however, if the glass contained a laboratory sample then the activity would be covered by the Control of Substances Hazardous to Health.³

Under COSHH Regulations, where it is not reasonably practicable to prevent exposure to a substance hazardous to health via elimination or substitution then the hazard must be adequately controlled by “applying protection measures appropriate to the activity and consistent with the risk assessment”.³

This includes the following controls listed in order of priority:

- “1. The design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials.
2. The control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and
3. Where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment”.³

All of the UK legislation and regulations outline the responsibilities of the employer and employee and also cover the unnecessary exposure to risk of service users, i.e. they cover NHS Scotland employees and patients.

It is important to note that there is no specific standard for eye protection worn in the health and care setting. The standards available for eye protection are general and apply to all eye protection worn in the working environment. This means that many of the tests are designed to ensure eye protection is appropriate for industrial uses e.g. chemical splashes, high impact projectiles, molten metals etc. General British and European standard BS EN 166: 2002 applies to spectacles (with or without lateral protection), goggles and face shields, all of which may conceivably be worn within the health and care setting.⁴

BS EN 166: 2002 outlines minimum basic requirements such as minimum robustness, field of vision, resistance to ignition, resistance to corrosion, width of headbands if applicable, materials used etc.⁴ There are a number of optional tests that may be conducted depending on the intended purpose or use of the eye protection and these include tests for protection against ‘droplets or splashes of liquid’. The tests are outlined in detail in standard BS EN 168: 2002.⁵

Standards BS EN 166 and BS EN 168 make it clear that spectacles cannot be tested for liquid splash or droplet protection as they are unable to protect against those hazards. It is outlined that face shields can be tested to meet splash requirements and goggles can be tested to meet droplet requirements but no eye protection appears to be able to meet both standards.^{4, 5} A frame marking of ‘3’ denotes that the eye protection is designed to protect against liquids (either droplets or splashes) but presumably the design of the eye protection (goggles or face shield) indicates which of these applies.^{4, 5}

A list of the specific standards which apply to eye/face protection in the working environment are outlined in [Appendix 1](#) of this document.

When/where should eye/face protection be used for SICPs?

UK legislation advises that employers instructions for use of PPE should be based on manufacturer’s instructions.²

Numerous expert opinion sources recommend that eye/face protection must be worn during any activities/procedures where there is a risk of blood, body fluids, secretions or excretions splashing or spraying into the eyes⁶⁻¹⁸ with only two sources advising eye protection for all surgical procedures.^{19, 20}

Several studies have been published which investigate the risk of splashing of blood or body fluids into the eyes of healthcare workers involved in different procedures, including general surgery,^{21, 22} endourological surgery,²³ dental surgery,²⁴ burn surgery,²⁵ dermatological surgery,²⁶⁻²⁸ tonsillectomy surgery,^{29, 30} oculofacial plastic surgery,³¹ and orthopaedic trauma surgery.³² Given that the risk of blood/body fluid splashing into the eyes was consistently demonstrated across all studies, it is reasonable to assume that it is a significant risk in all types of surgical procedure. Establishing if there is a difference in risk of facial splashing or contamination between scrubbed and non-scrubbed members of the surgical team during surgical procedures, was challenging. Endo et al (2007) established that, in a range of general surgeries, there was a statistically significant difference between the incidence of facial blood splatter for lead surgeons 167/200 (83.5%), first assistants 137/200 (68.5%) and scrub nurses 92/200 (46%), however, further information on average distances from the surgical site are not given.²² Stacey et al (2015) concluded that both surgeons who are close to the surgical field (64.2% of eye shields contaminated with an average of 4.4 splatters) and scrub nurses who may be “a few feet away” (58.9% of eye shields contamination with an average of 2.8 splatters) may be exposed to facial blood splatter.³¹

There is evidence to suggest that operators may have a poor perception of occurrence of facial splashes during surgical procedures which supports the concept that eye/face protection should be used for all surgical procedures regardless of operator predicted contamination. In a postal questionnaire of 159 U.K. based members of the British Society of Dermatological Surgery, the majority (53.5%) thought they received a splash in <1% of procedures, however, a corresponding observational study revealed the in-vivo percentage to be closer to 33%.²⁸ In a number of observational studies, operators were unaware of facial splash events on 86-100% of occasions.^{25, 27, 29-32}

The risk of transmission of blood borne viruses via splashes/sprays to the eyes is weak to moderate as, although cases of seroconversions following ocular exposure to blood have been reported, they provide no evidence of genetic sequencing investigations and are therefore considered probable rather than confirmed transmission events.³³⁻³⁵ There appears to be no strong direct evidence for transmission of other pathogens via blood and/or body fluid splashes to the eyes. Wearing eye protection to prevent transmission of BBVs and other pathogens is based on expert opinion and guidance.

In addition to procedures which are considered to generate splash and spray, it has been recommended that eye/face protection be worn during aerosol generating procedures. Based on expert opinion, this can consist of a face shield that fully covers the front and sides of the face in addition to a fluid resistant surgical face mask or fluid resistant FFP3 respirator OR goggles in addition to a fluid resistant surgical face mask or fluid resistant FFP3 respirator.^{10, 17} Use of a surgical mask or respirator depends on the infective status of the patient, see the following reviews for further information (SM and RPE reviews).

What type(s) of eye/face protection should be used for SICPs?

Regular corrective spectacles are not considered adequate protection from splashes of blood or body fluids,^{36, 37} and as such their use alone as eye/face protection is not recommended.^{10, 18, 38}

A variety of different types of eye/face protection are discussed in the health and care setting literature, including; goggles,^{10, 15, 17-19, 38-40} face shields,^{10, 15, 17-20, 40, 41} wrap-around glasses/safety spectacles,^{19, 20, 41} and masks with integrated visors.^{20, 41}

As previously outlined, standards BS EN 166 and BS EN 168 make it clear that safety spectacles cannot be tested for liquid splash or droplet protection as they are unable to protect against those hazards.^{4, 5} This concept is reflected in eye/face protection expert opinion papers which only refer to either goggles or visors^{10, 15, 17, 18, 40} and some American guidance where goggles are outlined to be the gold standard, face shields are cited as providing less than optimal protection and safety spectacles as not being suitable, however, these sources can only be considered expert opinion.^{38, 39} In fact, a recent in-vitro study suggested that 'disposable plastic glasses' were more effective at preventing conjunctival contamination than a face mask with integrated eye shield, but further research is needed, especially as this study did not assess full face shields or goggles.³⁶

Siegel et al state that a face shield which fully covers the face and its sides can be worn in place of a surgical mask and goggles when used for protection against splash and spray, however no evidence is cited for this recommendation.¹⁷

In standards BS EN 166 and BS EN 168 it is outlined that face shields can be tested to meet splash requirements and goggles can be tested to meet splash but not droplet requirements.^{4, 5} However, these standards are not specific to infection control in the health and care setting and are more suited to use in industrial settings.

From interpretation of standards, face visors used in isolation may be appropriate for routine splash and spray, however, they are likely unsuitable for AGPs. Limited anecdotal evidence has shown contamination beneath face visors following aerosol generating dental procedures with addition of a fluorescent dye marker.⁴²

Both American and UK sources of expert opinion consistently give broad, non-specific recommendations on selecting eye protection such as consideration of risk of exposure,^{10, 39, 40} nature of the hazard,^{10, 13, 18, 39, 43} availability,^{10, 40} local policy,^{10, 40} the task to be undertaken,^{10, 15, 18, 40} the duration of exposure,^{10, 13} personal vision needs^{18, 39} and availability of other PPE worn with the eye protection.^{13, 39}

Specific optimal design features of eye protection are sometimes outlined. UK experts recommend that disposable/single use eye protection is used^{6-8, 41} with American guidance recommending indirectly vented goggles with an anti-fog coating.^{18, 38} It is recommended that eye protection be comfortable, well fitted^{18, 39, 43-45} and have a 'wrap around' design providing sufficient peripheral vision and lateral protection.^{39, 44} In line with UK legislation, eye protection must be compatible with other supplied PPE, whilst the CDC highlight the need for eye protection to be able to fit over corrective eyewear.³⁹ UK legislation states that if multiple pieces of PPE are required, the employer shall make sure that the pieces are compatible with each other and in wearing them together, level of protection is not reduced.² PPE should be suitable

for the intended purpose, CE marked, fit the wearer appropriately and comply with PPE regulations 2002.²

When should eye/face protection be removed/changed?

There is a lack of evidence on when eye/face protection should be removed/changed.

It is recommended that eye/face protection should be removed or changed; in accordance with manufacturer's instructions; at the end of a clinical procedure/task and/or prior to leaving a dedicated clinical area.

The recommendation to remove/change eye/face protection at the end of every clinical procedure/task and/or surgery, regardless of visual contamination, is supported by a multitude of observational studies which show that a proportion of eye/face protection (5-30%) is likely to be contaminated, with non-visible blood and body fluids, following a surgical procedure.^{21-24, 26}

In line with the above UK expert opinion, Chalmers et al (2006) recommend that items of personal protective equipment must be changed between patients, however, they also recommend that PPE be changed between procedures on the same patient.⁹ No evidence is given for this recommendation and a barrier to interpretation lies in identifying the infection control rationale for this advice and clearly defining the end of one procedure and beginning of another on the same patient.⁹

It has also been recommended that eye/face protection used in surgery is removed/changed when contaminated,¹⁰ however, unless vision is compromised through contamination, mirroring the previous UK expert opinion source, the infection control rationale behind this recommendation is unclear and no supporting evidence is presented. In line with UK legislation, employees should not wear PPE when visibility is noticeably reduced.²

How should eye/face protection be donned?

There appears to be no scientific studies on the manner in which eye protection should be donned and all recommendations are based on expert opinion.

UK and American guidance is consistent in its recommendation that hand hygiene be performed before donning PPE^{10, 13} whilst European and American guidance consistently recommends that eye protection should fit appropriately and be tight enough to promote protection without significantly compromising comfort.^{13, 45, 46}

American guidance recommends that eye protection be pre-tested to ensure an appropriate fit when donning and use is undertaken.¹³

Before donning, the eye/face protection should be visually inspected for defects or aspects that may compromise vision.³⁸ Following placement over the eyes and any adjustments for fit,⁴⁷ if wearing a surgical mask or respirator, ensure facial protection (e.g. face shield) does not block the valve or filter and/or impede breathing.⁴³

Eye/face protection should not be touched once donned, if this occurs, hand hygiene should be performed.^{10, 13}

How should eye/face protection be doffed?

There appears to be no scientific studies on the manner in which eye protection should be doffed and all recommendations are based on expert opinion.

It is recommended that PPE should be removed in the following order to minimise the risk of cross/self-contamination: 1) Gloves 2) Apron 3) Eye/face protection 4) Mask/respirator.¹¹

Eye/face protection should be removed by handling only the headband or ear pieces as these parts are considered the least likely to be contaminated with splashes of blood or body fluids. If the front of the eye/face protection is touched during doffing, hand hygiene should immediately be performed.^{13, 47}

Hand hygiene should be performed following PPE doffing.¹¹

How should eye/face protection be reprocessed/disposed of?

Removal and disposal should be done in such a way as to avoid contamination of self, others or the environment.⁴³

It has been recommended that once removed, goggles should not be carried outside of the designated department/clinical area³⁸ and that after use, reusable eye/face protection is placed in a designated receptacle for reprocessing with disposable eye/face protection disposed of as healthcare (including clinical) waste.^{10, 13, 38, 47}

It is the employer's responsibility to ensure that appropriately disposed eye/face protection is destroyed and/or reprocessed in line with local policy.³

How should reusable eye/face protection be decontaminated?

UK guidance has stated that use of reusable eye/face protection may be appropriate only if it is adequately decontaminated between uses.⁴¹ There appears to be little to no evidence to support a specific process for cleaning or decontamination of eye/face protection. Evidence for specific processes and/or chemicals is likely to be highly specific for different types of eye/face protection, which is why following manufacturer's instructions is advised^{19, 38, 39, 46, 48} although, a systematic review of manufactures instructions found that these can often be confusing for users.⁴⁸

Further guidance has suggested that reusable eye/face protection should be physically cleaned with a detergent, disinfected with a hospital designated disinfectant, rinsed and allowed to air dry.^{38, 39, 46}

It is advised that gloves are worn when decontaminating eye protection^{38, 39, 46} and that hand hygiene should be performed afterwards,⁴⁶ however, no specific evidence is cited for this. Following decontamination, air drying of eye protection is recommended^{38, 39, 46} but if quick re-use is required a non-linting soft cloth is recommended, however, again, there is no evidence to support this.³⁸

How should eye/face protection be stored?

There appears to be little to no evidence to support specific storage recommendations for eye/face protection.

Guidance and legislations outlines that eye/face protection should be stored in a well-defined place, protected from direct sunlight, heat sources and liquids, including chemicals, in an area that is clean and protected from contamination.^{2, 10, 38}

UK legislation outlines that PPE should be maintained in an efficient state, efficient working order, good repair and in a clean condition.^{2, 3} PPE should be properly stored in a well-defined place, checked at suitable intervals with adherence to expiry dates; and when discovered to be defective, repaired or replaced before further use.^{3, 10}

3.2 Implications for practice TBPs

When/where should eye/face protection be used for TBPs?

In line with SICPs recommendations, eye protection should be worn for the care of patients with pathogens which are likely to generate symptoms associated with splash and spray of body fluids such as sneezing and/or coughing associated with respiratory infections.^{6-13, 15, 16}

There is weak evidence to support the recommendation that eye protection should be worn for potentially infectious AGPs⁴⁹ but this recommendation would also fall in line with a need for eye protection when there is anticipated splash or spray of body fluids.⁶⁻¹⁸ There is virtually no evidence to support a general recommendation of wearing eye protection for all care of patients infected with respiratory pathogens, i.e. where splash or spray is not anticipated, but is recommended in historic US pandemic influenza guidance⁴³ and recent European COVID-19 guidance.^{45, 50} A systematic review, focused on nosocomial RSV infection, concluded that there was currently not enough high quality evidence to establish whether a specific type of intervention (eye protection) was effective at reducing infection rates in patients and/or staff.⁵¹

What type of eye/face protection should be worn for TBPs?

In regards to non-AGP transmission based precautions, wearing only a face shield is supported by little to no evidence.^{17, 52} For non-AGP patient care, English and European COVID-19 IPC guidance consistently recommends eye protection (visor or goggles) combined with a fluid resistant surgical mask for the care of suspected or confirmed COVID-19 cases.^{50, 53} American guidance documents provide a lack of clarity on non-AGP related, infectious patient care and the types of eye protection required.^{15, 17} English IPC guidance (non-COVID-19) does not provide recommendations on specific types of eye protection that should be worn.¹¹

As previously outlined, British/European standards BS EN 166 and BS EN 168 make it clear that spectacles cannot be tested for liquid splash or droplet protection as they are unable to protect against those hazards. It is outlined that face shields can be tested to meet splash requirements and goggles can be tested to meet droplet requirements but no eye protection appears to be able to meet both standards.^{4, 5} A frame marking of '3' denotes that the eye protection is designed to protect against liquids (either droplets or splashes) but presumably the design of the eye protection (goggles or face shield) indicates which of these applies.^{4, 5}

However, these standards are not specific to infection control within the health and care setting and are more suited to industrial settings.

3.3 Implications for research

Consensus is needed on the use of specific eye/face protection types for clinical procedures to ensure that healthcare workers/facilities comply with best infection prevention and control practice. Specifically, studies which compare different types of eye protection for the treatment of patients infected with respiratory pathogens are needed.⁵² In line with this concept, more research is needed generally on the propensity for different infections, specifically respiratory pathogens, to be transmitted via the ocular route and the protective effect of eye protection.⁵⁴⁻⁶¹

Eye protection is currently recommended for anticipated splash or spray, however, further evidence is needed on its requirement for protection against surgical dust and smoke.⁶²

Some observational studies have demonstrated that eye protection may not always be effective, however, the exact reasoning behind the PPE failure is often not clear and this phenomenon requires further exploration.^{26, 29, 36, 63, 64}

Furthermore, there may be a need to clarify or expand legislation relating to the use of appropriate PPE in the healthcare setting. At present much of the legislation relates to the handling and management of dangerous substances and/or chemicals, and is generally not relevant to infection prevention within a clinical environment. Specific International, European or British standards for eye protection worn within the health and care setting, are needed.

The COVID-19 pandemic has highlighted the need for more evidence on reuse and extended use of eye protection.^{65, 66}

4 Recommendations

4.1 Recommendations for SICPs

This review makes the following recommendations based on an assessment of the extant professional literature on the use of eye/face protection as PPE for standard infection control purposes in the **clinical** care environment:

Are there any legislative requirements for the use of eye/face protection as PPE for infection control purposes?

There is no direct legislative requirement to wear eye/face protection for the purposes of the prevention and control of infection; however, the Health and Safety at Work Act (1974), Control of Substances Hazardous to Health (2002 as amended) regulations and Personal Protective Equipment at Work Regulations 1992 (as amended) legislate that employers (i.e. NHS Scotland) must provide PPE which affords adequate protection against the risks associated with the task being undertaken. Employers have a responsibility to provide clear instruction and information on how to use provided PPE and healthcare workers (HCWs) have a responsibility to ensure that suitable PPE is worn correctly for the task being undertaken.

(Mandatory)

Specific standards relating to the quality and performance of eye/face protection are outlined in [Appendix 1](#).

When/where should eye/face protection be used for SICPs?

Eye/face protection must be worn during activities/procedures where there is a risk of blood, body fluids, secretions or excretions splashing into the eyes/face.

(Category C recommendation)

Employers instructions for use of PPE should be based on manufacturer's instructions.

(Mandatory)

In the theatre environment

Eye/face protection should be worn by all members of the surgical team during all surgical procedures.

(Category C recommendation)

When should eye/face protection be removed/changed?

Eye/face protection must be removed or changed:

- in accordance with manufacturer's instructions;
- if vision is compromised through contamination with blood or body fluids;
- if the integrity of the equipment is compromised
- at the end of a clinical procedure/task;
- prior to leaving the dedicated clinical area.

(Category C recommendation)

What type(s) of eye/face protection should be used for SICPs?

Regular corrective spectacles are not appropriate eye/face protection.

(Category B recommendation)

Select eye/face protection according to the need anticipated by the task to be performed and the risk associated with the procedure.

(Category C recommendation)

1) A face shield that fully covers the front and sides of the face OR 2) goggles in addition to a fluid resistant type IIR surgical face mask, should be worn during activities/procedures where there is a risk of blood, body fluids, secretions or excretions splashing into the eyes/face, out with AGPs.

(Category C recommendation)

1) A face shield that fully covers the front and sides of the face in addition to a fluid resistant type IIR surgical face mask OR 2) goggles in addition to a type IIR fluid resistant surgical face mask should be worn for aerosol generating procedures on patients who are not suspected of being infected with a respiratory pathogen.

(Category C recommendation)

Safety spectacles are not recommended for use as protection against splash or spray

(Mandatory)

PPE should be suitable for the intended purpose, CE marked, fit the wearer appropriately and comply with PPE regulations 2002.

(Mandatory)

If multiple pieces of PPE are required, the employer shall make sure that they are compatible with each other and in wearing them together, do not reduce the level of protection provided.

(Mandatory)

Employees should not wear PPE when visibility is noticeably reduced.

(Mandatory)

Goggles and face shields should be tested in line with EN 166: 2001 for protection against liquid droplets and splashes.

(Mandatory)

Eye protection should cover the full peri-orbital region and wrap around the sides of the face

(Category B recommendation)

How should eye/face protection be donned?

Eye protection should have been pre-tested to ensure appropriate fit

- Perform hand hygiene before donning PPE
- Inspect the eye/face protection for defects or anything that may impede vision
- Place over eyes and, if applicable, adjust to fit ensuring that straps are tight, but not too tight.
- Ensure eye/face protection does not compromise the fit of other PPE

If wearing a surgical mask or respirator, ensure facial protection (such as a face shield) does not block the valve or filter and/or impede breathing

Eye/face protection should not be touched when worn, if this occurs, hand hygiene should be performed

PPE should be put on in the following order to minimise the risk of self/cross contamination: 1) Apron/gown 2) Mask/respirator 3) Eye/face protection 4) Gloves

(Category C recommendation)

See [Appendix 6 \(Putting On and Removing PPE\)](#) of the NIPCM for further information.

How should eye/face protection be doffed?

PPE should be removed in the following order to minimise the risk of cross/self-contamination:
1) Gloves 2) Apron/gown 3) Eye/face protection 4) Mask/respirator.

(Category C recommendation)

Eye/face protection should only be removed by handling head band or ear pieces.

(Category C recommendation)

Hand hygiene should be performed after PPE removal

(Category C recommendation)

In order to remove goggles, bend head forward, place index fingers and thumb under strap at back of head and lift strap upwards whilst pushing frame away from face, lower goggles away from face. Face shields/glasses should be removed by grasping sides and pulling directly forward, away from face.

(Category C recommendation)

See [Appendix 6 \(Putting On and Removing PPE\)](#) of the NIPCM for further information.

How should eye/face protection be reprocessed/disposed of?

After use, place reusable eye/face protection in a designated receptacle for reprocessing. Disposable eye/face protection should be disposed of as healthcare (including clinical) waste.

(Category C recommendation)

Once removed, goggles should not be carried outside of the department/clinical area

(Category C recommendations)

It is the employer's responsibility to ensure that appropriately disposed eye/face protection is destroyed and/or reprocessed in line with local policy

(Mandatory)

How should reusable eye/face protection be decontaminated?

Reusable eye/face protection should be decontaminated between uses.

(Category C recommendation)

Reusable eye/face protection should be decontaminated in accordance with the manufacturer's instructions.

(Category C recommendation)

Eye/face protection marked as single use should not be reprocessed

(Mandatory)

Gloves (in line with manufacturer's instructions) should be worn by those decontaminating reusable eye protection and hand hygiene should be performed on completion of the task

(Category C recommendation)

How should eye/face protection be stored?

Eye/face protection should be stored in a designated place, away from direct sunlight, heat sources and liquids, including chemicals, in an area that is clean and protects eye/face protection from contamination. Eye protection should be stored in line with manufacturer's instructions.

(Mandatory)

Eye protection should be regularly inspected, kept clean and in good working order with adherence to expiry dates

(Mandatory)

4.2 Recommendations for TBPs

Please note: TBPs when used, are to be applied in addition to SICPs.

This review makes the following recommendations based on an assessment of the extant professional literature on the use of eye/face protection as PPE for transmission based infection control purposes in the **clinical** care environment:

When/where should eye/face protection be worn for TBPs?

Eye/face protection should be worn by all of those in the room when potentially infectious AGPs are conducted.

(Category B recommendation)

Eye/face protection should be worn when splashing/spraying of body fluids is anticipated - this includes during the treatment of sneezing and coughing patients

(Category C recommendation)

Eye/face protection should be worn for the care of patients with novel infectious agents including pandemic influenza

(Category C recommendation)

What type of eye/face protection be worn for TBPs?

For AGPs performed on patients with suspected airborne or droplet transmitted infectious agents, facial protection should be provided by goggles and a fluid resistant FFP3 respirator OR a full face shield and fluid resistant FFP3 respirator.

(Category C recommendation)

For non-AGP care of symptomatic patients, infected with droplet transmitted infectious agents, a fluid resistant type IIR surgical mask should be worn in addition to eye protection in the form of goggles or a full face shield.

(Category C recommendation)

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Appendix 1: Standards pertaining to eye/face protection as PPE

Standard	Title	Description	Publication date
BS 7028:1999	Eye protection for industrial and other uses. Guidance on selection, use and maintenance.	This standard outlines the Selection, Maintenance of Face shields, Filters (eye protectors), in relation to Industrial, Hazards, Chemical hazards, Radiation hazards, Electromagnetic radiation, and also covers Goggles (safety), Safety spectacles, Welding, Lasers, and the Marking, Inspection, Cleaning, Storage, Repair, Education in terms of eye protection.	November 1999.
BS EN 166:2002	Personal eye protection. Specifications.	This standard outlines the specifications of Eye protectors, Optical instruments, Goggles (safety), Optics, Spectacles (eyeglasses), Accident prevention, Designations, Marking.	January 2002.
BS EN 167:2002	Personal eye protection. Optical tests	Specifies optical test methods for eye-protectors.	January 2002
BS EN 168:2002	Personal eye-protection. Non-optical test methods.	This standard outlines Mechanical testing, Performance testing for Eye protectors, Face shields, Goggles (safety), Safety spectacles.	January 2002.
BS EN 13921:2007	Personal protective equipment. Ergonomic principles.	This standard provides guidance on the generic ergonomic characteristics related to personal protective equipment (PPE) – it does not however cover the requirements which relate to specific hazards that PPE may be designed.	September 2007.

ISO 18526–3: 2020	Eye and face protection — Test methods — Part 3: Physical and mechanical properties.	Reference test methods for determining the physical and mechanical properties of eye and face protectors.	January 2020
Statutory Instrument 2002 No. 1144	Health and Safety – Personal Protective Equipment Regulations 2002	This instrument sets out the standards for PPE in the UK. Schedule 4 sets out the standards for conformity across the UK (and the EU) and requires that all PPE is CE marked . CE marking demonstrates that an item has been manufactured to a particular standard and passed the appropriate tests for the PPE type and intended use/purpose.	May 2002.

Legend:

BS = British Standards produced by the British Standard Institution (www.bsigroup.co.uk)

EN = European Standards (European Norm) produced by the European Committee for Standardisation (www.cen.eu)

ISO = International Standards produced by the International Standards Organization (www.iso.org)

EN standards are gradually being replaced by ISO standards – when these are adopted in the UK they are prefixed with BS (e.g. BS EN ... or BS EN ... or BS EN ISO ...). This is usually to accommodate UK legislative or technical differences or to allow for the inclusion of a UK annex or foreword.

Appendix 2: Grading of recommendations

Grade	Descriptor	Levels of evidence
Mandatory	'Recommendations' that are directives from government policy, regulations or legislation	N/A
Category A	Based on high to moderate quality evidence	SIGN level 1++, 1+, 2++, 2+, AGREE strongly recommend
Category B	Based on low to moderate quality of evidence which suggest net clinical benefits over harm	SIGN level 2+, 3, 4, AGREE recommend
Category C	Expert opinion, these may be formed by the NIPC groups when there is no robust professional or scientific literature available to inform guidance.	SIGN level 4, or opinion of NIPC group
No recommendation	Insufficient evidence to recommend one way or another	N/A