NHS National Services Scotland

Personal Protective Equipment (PPE): Eye/Face Protection Literature Review

Considered Judgement Forms

Version 1.0

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ARHAI Scotland

Antimicrobial Resistance and Healthcare Associated Infection

Version history

Version	Date	Summary of changes
V1.0	February 2025	New document.

Approvals

Version	Date Approved	Group/Individual
V1.0	January 2025	National Policy, Guidance and Evidence Working Group

Contents

Summary of Recommendations (R) and Good Practice Points (GPP)

Research question 2: What types of eye/face protection are recommended for health and care settings?

GPP2.1	**The following types of eye/face protection are suitable for use in health and care settings:** **• goggles** **• face shields/visors** **• safety glasses with solid side shields** **• eye protection which is built into surgical masks**
GPP2.2	**Prescription eyeglasses and contact lenses should not be worn to provide eye/face protection.**
GPP2.3	**Where prescription eyeglasses are required to be worn by the wearer, prescription protective eyewear which incorporates prescription lenses should be worn.** **Or eye/face protection should be worn over prescription eyeglasses. The types of eye/face protection suitable for use over prescription eyeglasses include:** **• goggles** **• face shields/visors**

Research question 3: Are there any legislative requirements or standards (BS/EN/ISO) relating to the use of eye/face protection for infection prevention and control purposes?

R3.1	**There is no direct legislative specific to the 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 must provide PPE which affords adequate protection against the risks associated with the task being undertaken. Employers must provide clear instruction and information on how to use provided PPE and healthcare workers (HCWs) must ensure that suitable PPE is worn correctly and in line with manufacturer's instructions for the task being undertaken.**

R3.2	**The following legislation must be adhered to when eye/face protection is worn in Scottish health and care settings:** **• The Health and Safety at Work etc. Act 1974** **• The Management of Health and Safety at Work Regulations 1999** **• The Control of Substances Hazardous to Health (Amendment) Regulations 2004** **• The Personal Protective Equipment at Work (Amendment) Regulations 2022 (PPER 2022)**
GPP3.1	**Eye/face protection intended for use in health and care settings should meet the relevant standards as detailed in Appendix 2 of the literature review.**

Research question 4: When should eye/face protection be worn by health and care staff?

R4.1	**Eye/face protection should be worn when there is an anticipated risk of splashing and/or spraying of blood or body fluids.**
GPP4.1	**Extended use of eye/face protection (worn for care of successive service users without removal between) should be applied during cohort isolation only.**
GPP4.2	**The following factors should be considered when deciding what type of eye/face protection to wear:** **• the appropriateness for the task being undertaken,** **• the type of anticipated exposure,** **• and the fit of the eye/face protection.**

Research question 5: When should eye/face protection be worn by a service user/visitor?

GPP5.1	**Visitors should be offered eye/face protection when providing direct care if splashing and/or spraying is anticipated.**

Research question 6: Where and how should eye/face protection be donned (put on)?

R6.1	**Where two or more items of PPE are worn, these must be compatible with one another.**
GPP6.1	**Eye/face protection should be checked for any damage or defects prior to donning (putting on).**
GPP6.2	**Eye/face protection should be donned (put on) outside of the service user's room/care area, or within an ante room.**

GPP6.3	**Hand hygiene should be performed prior to donning (putting on) eye/face protection, or all PPE when worn as part of an ensemble.**
GPP6.4	**When eye/face protection is being worn as part of a PPE ensemble, eye/face protection should be donned (put on) after a surgical face mask or respirator and before donning gloves.**
GPP6.5	**Eye/face protection should be worn in accordance with manufacturer's instructions, including use within expiration dates.**
GPP6.6	**Once donned (put on), eye/face protection should not be touched or worn around the neck or on top of the head when not in use.**

Research question 7: Where and how should eye/face protection be doffed (taken off)?

R7.1	**Eye/face protection must be doffed (removed) "on leaving the work area", in-line with COSHH legislation. This can be immediately before or after leaving the work area.**
GPP7.1	**Hand hygiene should be performed before doffing (removing) eye/face protection, and after doffing all other items of PPE when worn as part of a PPE ensemble.**
GPP7.2	**When eye/face protection is worn as part of a PPE ensemble, eye/face protection should be doffed (removed) after the doffing of gloves and doffing of a gown, apron or coverall, but before doffing a surgical face mask or respirator, to minimise the risk of cross-contamination.**
GPP7.3	**Eye/face protection should be removed using two hands and by only handling the part(s) that secure the equipment to the wearers head, for example by the headband or side arms.** **Eye/face protection with a headband should be removed by using two hands to pull the elastic strap away from behind the wearer.**
R7.2	**Once removed, eye/face protection must be subsequently cleaned/decontaminated or, if necessary, disposed of, in-line with COSHH legislation.**
GPP7.4	**Reusable eye/face protection should be placed in a designated container for subsequent cleaning and/or decontamination, where necessary.**

Research question 8: When should eye/face protection be changed or removed?

GPP8.1	**Eye/face protection should be changed or removed when vision is impaired due to visible soiling/contamination or damage.**
GPP8.2	**Eye/face protection should be changed or removed when a clinical procedure or task has been completed and/or there is no longer an exposure risk.**
GPP8.3	**Extended wearing of eye/face protection (worn for care of successive service users without removal between) should be changed or removed:** **• when contaminated by blood or body fluids (after individual service user contact, before contact with the next service user)** **• when vision is impaired due to visible soiling/contamination or damage**
GPP8.4	**Eye/face protection that is damaged should be discarded.**

Research question 9: How should eye/face protection be disposed of?

GPP9.1	**Eye/face protection labelled single use should be disposed of after use.**
GPP9.2	**Eye/face protection should be disposed of in a waste container as clinical waste.**
GPP9.3	**Hand hygiene should be performed after disposing of eye/face protection.**

Research question 10: How should reusable eye/face protection be reprocessed/decontaminated?

R10.1	**Employers should ensure that cleaning and/or disinfecting arrangements are in place for reusable eye/face protection.**
GPP10.1	**Reusable eye/face protection should be cleaned and/or disinfected according to manufacturer's instructions, or in line with local policy or procedure.**
GPP10.2	**Reusable eye/face protection should be cleaned and/or disinfected before being re-used or stored.**
GPP10.3	**Hand hygiene should be performed after the cleaning and/or disinfecting of reusable eye/face protection.**

Research question 11: How should eye/face protection be stored?

R11.1	**When not being used, eye/face protection must be stored in a well-defined, safe storage place where it is protected from loss, contamination, and damage, such as from direct sunlight.**

Research question 1: What is eye and face protection?

Part A: Quality of evidence

1.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
In total, 10 pieces of evidence were included to answer this research question.[1-10] This was a new research question added as part of this current update to the review. All evidence consisted of guidance that was graded SIGN50 Level 4 expert opinion. Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is often a lack of supporting evidence and an unclear methodology for formulating the guidance. SIGN50 Level 4 evidence on its own is considered insufficient for the formation of Recommendations but can be used to inform the development of Good Practice Points.	10 x SIGN50 Level 4, expert opinion

1.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
• All identified expert opinion documents provide a definition of eye and face protection. The evidence-base varies slightly in the terminology used, however, ultimately the definitions provided are consistent. • There is consistency amongst the evidence base (10 SIGN50 Level 4) that eye and face protection is provided by eye and face protective equipment, used to reduce the risk of exposure to the mucous membranes of the eyes,[1-10] nose,[5, 6] and mouth.[5, 6] • The evidence differed in how risk of exposure was defined, definitions included; potentially infectious material,[8] pathogens,[2, 7] virus exposure,[9] or blood and/or body fluid exposure.[1, 3, 5, 6, 8, 10] One piece of evidence, published by the Royal College of Nursing, did not define the exposure type.[4]

1.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance was conducted and/or applies to are as follows: • UK (n=3)[1, 2, 4] • USA (n=2)[6, 8] • Australia (n=1),[3] • Canada (n=1)[7] • New Zealand (n=1)[10] • Europe/EU/EEA (n=1)[9] • International (n=1)[5]

Comments
Eye and face protection definitions provided are directly applicable to any health and care setting, including those in Scotland. The evidence base identified is applicable to the target population. All expert opinion documents identified were specific to health and care settings.[1-10] One expert opinion document was published by the European Centres for Disease Prevention and Control (ECDC) and is therefore applicable to the European Union (EU)/European Economic Area (EEA).[9] Another was published by the World Health Organization (WHO) and therefore applies internationally.[5]

1.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were included.

1.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
Definitions for eye and face protection are well established, and therefore publication bias is not a concern.

Part B: Evidence to decision

1.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
This research question aimed to outline how eye/face protection is described within the literature. It therefore does not have any associated recommendation(s) or good practice point(s).	Not applicable.

1.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
Not applicable.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
Not applicable.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
Not applicable.

1.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
Not applicable.

1.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
Not applicable.

1.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
Not applicable.

1.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/religious reasons

Intentional vagueness
Not applicable.

1.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
Not applicable.

1.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
Not applicable.

Research question 2: What types of eye/face protection are recommended for health and care settings?

Part A: Quality of evidence

2.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
In total, 24 pieces of evidence were included to answer this research question. Six pieces of evidence were included in previous version(s) of this literature review,[4, 8, 9, 11-13] and 18 were included in this update.[2, 3, 5-7, 10, 14-25] One guideline graded AGREE: 'Recommend with modifications' was included.[21] Whilst this guideline is based on a systematic literature review, some aspects of the methods are not provided, such as the search strategy. Additionally, the link between recommendations and supporting evidence is unclear. The remaining evidence (n=23) was graded SIGN50 Level 4 expert opinion.[2-20, 22-25] This is potentially subject to bias as there is often a lack of supporting evidence and an unclear methodology for formulating the guidance. No primary evidence was identified for this research question.	23 x SIGN50 Level 4, expert opinion 1 x AGREE: Recommend with modifications

2.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments

Eye/face protective equipment

- The evidence base (one AGREE: 'Recommend with modifications' and 18 SIGN50 Level 4) is consistent regarding the types of eye and face protective equipment worn in health and care setting. These are goggles,[2-5, 7-10, 13-18, 21, 23, 24] face shields/visors,[2-10, 12-18, 21, 23] safety glasses [3, 7, 8, 10, 14, 15, 18] (sometimes referred to as safety spectacles)[12] with solid side shields,[3, 6, 10, 14] and surgical face masks with integrated face shields.[8, 12, 23]
- Only one piece of SIGN50 Level 4 expert opinion states healthcare workers may consider wearing powered air purifying respirators or full facepiece elastomeric respirators, which have built in eye protection, when respiratory protection is required.[19]
- There is consistency between the Health and Safety Executive (HSE) and British Standard (BS) 7028:1999 (three SIGN50 Level 4), which apply to all occupational settings, that eye and face protective equipment includes goggles, face shields, and safety glasses.[11, 20, 22]
- There was variation in the design features of goggles, face shields and safety glasses described within the evidence base.
    - There is consistency within the evidence base (three SIGN50 Level 4) that goggles are described to consist of lenses and an elastic headband to hold them in place,[8, 11, 20] they may also incorporate direct or indirect ventilation,[8, 11, 20] and/or have anti-fog coatings.[3, 8] Where direct/indirect vents are positioned on the goggles is not provided by the evidence base.

Comments

- Only one piece of SIGN50 Level 4 expert opinion provides further classification as box or cup type goggles, differing by having one or two oculars, respectively.[11]
- There is consistency within the evidence base (eight SIGN50 Level 4) that face shields extend below the chin,[14, 15] and/or cover the full face[10-12, 15] (including the sides of the face).[17, 18] And that face shields are described as consisting of a large single lens with a frame or moulded visor attached to a brow guard with an adjustable headband.[11, 20]
- Only one piece of SIGN50 Level 4 expert opinion states face shields can be open at the bottom.[8]
- There is consistency within the evidence (six SIGN50 Level 4) that solid side shields[3, 6, 10, 14] on safety glasses provide lateral protection.[11, 20] The BSI and HSE state safety glasses can be of twin or singular ocular type, with single ocular also referred to as eye shields.[11, 20]

- There is consistency within the evidence (one AGREE: 'Recommend with modifications' guideline and nine SIGN50 Level 4) that prescription eyeglasses[2, 7, 10, 12, 21, 25] and contact lenses are not considered eye/face protection.[3, 8, 13, 15]
  - There is consistency amongst nine SIGN50 Level 4 guidance documents that some types of goggles,[3, 8, 10, 11, 13, 15] face shields/visors[2, 10, 11, 15, 20, 25] and single ocular spectacles can be worn over prescription glasses.[11, 20]
  - Five SIGN50 Level 4 expert opinion guidance documents state prescription protective eyewear which incorporate prescription lenses are also available.[3, 8, 10, 15, 20]
  - One SIGN50 Level 4 expert opinion guidance document by the National Health and Medical Research Council (NHMRC) provides requirements for prescription eyewear to be considered appropriate eye/face protection. These include that eyewear must be close fitting

Comments
between the frame and face, provide full coverage around the eyes, and have indirect side protection.[3] If the prescription eyewear has these features, additional protective eyewear is said to not be required.[3]

2.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries where the research was conducted, or to which the guidance applies are as follows: • UK (n=8)[2, 4, 11, 12, 20, 22, 23, 25] • International (n=3)[5, 21, 24] • Europe/EU/EEA (n=1)[9] • USA (n=8)[6, 8, 13, 14, 16-19] • Australia (n=2)[3, 15] • Canada (n=1)[7] • New Zealand (n=1)[10] Of the eight expert opinion documents published in the UK,[2, 4, 11, 12, 20, 22, 23, 25] five were published for UK health and care settings.[2, 4, 12, 23, 25] The remaining three documents are not specific to health and care settings, these include one British Standard and two HSE guidance documents.[11, 20, 22] However, they are more generalised and can therefore be applied to health and care settings.

Comments
Two expert opinion guidance documents and one AGREE: 'Recommend: with modifications' were published by the WHO for health and care settings, and therefore applies internationally.[5, 21, 24] One expert opinion guidance document was published by the ECDC for health and care settings and is therefore applicable to the European Union (EU)/European Economic Area (EEA).[9] The remaining expert opinion guidance published in the USA,[6, 8, 13, 14, 16-19] Australia,[3, 15] Canada,[7] and New Zealand[10] is directly applicable to heath and care settings.

2.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

2.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

2.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
GPP2.1 The following types of eye/face protection are suitable for use in health and care settings: • goggles • face shields/visors • safety glasses with solid side shields • eye protection which is built into surgical masks	Good Practice Point
GPP2.2 Prescription eyeglasses and contact lenses should not be worn to provide eye/face protection.	Good Practice Point
GPP2.3 Where prescription eyeglasses are required to be worn by the wearer, prescription protective eyewear which incorporates prescription lenses should be worn.	Good Practice Point

Recommendation	Grading
Or eye/face protection should be worn over prescription eyeglasses. The types of eye/face protection suitable for use over prescription eyeglasses include: • goggles • face shields/visors	

2.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
GPP2.1 Not applicable. GPP2.2 Not wearing prescription eyeglasses solely as eye/face protection prevents the wearer from exposure to potential infection risks. GPP2.3 Wearing of the appropriate specified types of eye/face protection over prescription eyeglasses offers protection from potentially infectious agents.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
GPP2.1 No harms anticipated. GPP2.2 No harms anticipated.

Risks and harms
GPP2.3 Wearing of certain types of eye/face protection over prescription eyeglasses may impair user vision. It may also be uncomfortable for the wearer.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
GPP2.1 Not applicable. GPP2.2 Only benefits identified. GPP2.3 Although wearing of certain types of eye/face protection prescription eyeglasses may impair vision and be uncomfortable, there is a risk of exposure to potentially infectious particles if eye/face protection is not worn by the user. Therefore, the benefits outweigh the potential harms.

2.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
None.

2.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often

involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
GPP2.1 One ARI-specific guideline by the WHO graded AGREE: 'Recommend with modifications'[21] and 18 SIGN50 Level 4 guidance documents[2-10, 12-18, 23, 24] support that the types of eye and face protection suitable for use in health and care settings includes goggles,[2-5, 7-10, 13-18, 21, 23, 24] face shields/visors,[2-10, 12-18, 21, 23] safety glasses[3, 7, 8, 10, 12, 14, 15, 18] with solid side shields,[3, 6, 10, 14] and surgical face masks with integrated face shields.[8, 12, 23] The evidence was considered insufficient for a recommendation due to the narrow scope of the WHO guidelines, therefore a good practice point was developed. GPP2.2 One ARI-specific guideline by the WHO graded AGREE: 'Recommend with modifications'[21] and nine SIGN50 Level 4 guidance documents[2, 3, 7, 8, 10, 12, 13, 15, 25] support that prescription eyeglasses[2, 7, 10, 12, 21, 25] and contact lenses are not considered eye/face protection.[3, 8, 13, 15] The evidence was considered insufficient for a recommendation due to the narrow scope of the WHO guidelines, therefore a good practice point was developed. GPP2.3 ARHAI Scotland and its stakeholders support extant expert opinion that when prescription eyeglasses are required to be worn by the wearer, prescription protective eyewear which incorporates prescription lenses should be worn,[3, 8, 10, 15, 20] or eye/face protection should be worn over prescription eyeglasses. ARHAI Scotland and its stakeholders support extant expert opinion that goggles and face shields/visors are suitable for wearing over prescription eyeglasses.[2, 3, 8, 10, 11, 13, 15, 20, 25]

2.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state "none". Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

2.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/religious reasons

Intentional vagueness
GPP2.1 The design features of the types of eye/face protection listed have intentionally not been provided. This is due to a lack of evidence regarding design specifications associated with types of anticipated exposure.

2.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

2.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
GPP2.1 There is a lack of distinction between what types of eye/face protection are considered eye protection and/or face protection specifically for health and care settings within the evidence base. Further clarification of this would be beneficial.

Research question 3: Are there any legislative requirements or standards (BS/EN/ISO) relating to the use of eye/face protection for infection prevention and control purposes?

Part A: Quality of evidence

3.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
Eight standards were identified in relation to eye and face protection. Four standards were identified in previous version(s) of this literature review[11, 26-28]. Four additional standards were identified during this update.[29-32] All standards were graded SIGN50 Level 4 expert opinion as there is a lack of supporting evidence and an unclear, methodology for formulating these standards. Six pieces of legislation were also identified in relation to this research question.[33-38] Two pieces were identified in previous version(s) of this literature review,[35, 36] and four additional pieces were identified during this update.[33, 34, 37, 38] All legislation is graded as mandatory.	8 x SIGN50 Level 4 Standards 6 x Mandatory Legislation

3.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments

Due to the nature of the evidence, consistency amongst standards relevant to eye and face protection could not be evaluated.

- There is no specific standard for eye protection worn within the health and care setting for infection control purposes.
- The standards available are general and apply to eye protection worn for protection against any occupational hazard, including droplets and liquid splashes.[11, 26-32]
- The British Standards BS EN ISO 168:2002 and BS EN ISO 18526-3 provide several optional tests that may be conducted depending on the intended purpose or use of the eye protection for non-optical eye protection.[11, 27] Of these, several tests are likely to be relevant to eye/face protection worn in a health and care setting, including area of coverage of face shields, protection against droplets, protection against large dust particles, and protection against gases and fine dust particles.[27, 28] Test methods outlined in these standards appear to be similar with slight variations, such as different test solution agents to test against droplet exposure.[27, 28] BS EN ISO 168:2002 provides a test for 'liquid splashes',[28] BS EN ISO 18526-3 does not provide any test against splashes, instead providing a test for protection against 'stream of liquids'.[27] It is unclear why two standards are available for similar test methods for eye/face protection.
- BS EN ISO 18526-3 also provides the following test methods which may be relevant to infection prevention and control (IPC), these include assessing area of protection from frontal and lateral directions and assessing the retention by the headbands of eye 'protectors'.[27] Within the test for protection against droplets and liquid splashes provided by BS EN ISO 168:2002, it is outlined the test for protection against 'droplets' applies to goggles only, and the test for protection against 'liquid splashes' applies to face shields only. BS 7028:1999, which

Comments

provides guidance on selection of specific types of eye/face protection based on their performance, aligns with this.[11]

Due to the nature of the evidence, consistency amongst the legislation identified for this research question could not be evaluated. Legislation relevant to eye and face protection identified includes:

- The Health and Safety at Work Act 1974 (HSWA) is the generic health and safety legislation relating to occupation health at work.[35]
- The Management of Health and Safety at Work Regulations 1999 (MHSWR) provides further duties employers and employees must fulfil to maintain health and safety at work.[33]
- The Control of Substances Hazardous to Health (Amendment) Regulations 2004 (COSHH), which describe requirements to protect employees from substances hazardous to their health within the workplace.[36]
- The Personal Protective Equipment at Work (Amendment) Regulations 2022 applies to employers and employees and outlines their duties regarding PPE. This legislation covers, but is not limited to, provision of PPE, compatibility of PPE, assessment of PPE, maintenance and replacement of PPE, and use of PPE and storage.[38]
- The Personal Protective Equipment (Enforcement) Regulations 2018 incorporates Regulation (EU) 2016/425 (as incorporated into UK law). The regulations set out the essential health and safety requirements that must be met before PPE products can be placed on the Great British market.[34, 37]

3.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
Legislation identified is directly applicable to Scotland, however no legislation identified is specific to health and care settings. Standards identified are directly applicable to Scotland, however no standards specific to health and care settings were identified. The identified standards for eye and face protection are general and apply to all eye protection worn in a working environment.

3.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

3.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
Risk of publication bias is not applicable due to the type of evidence identified for this research question.

Part B: Evidence to decision

3.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
R3.1 There is no direct legislative specific to the 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 must provide PPE which affords adequate protection against the risks associated with the task being undertaken. Employers must provide clear instruction and information on how to use provided PPE and healthcare workers (HCWs) must ensure that suitable PPE is worn correctly and in line with manufacturer's instructions for the task being undertaken.	Recommendation

Recommendation	Grading
R3.2 The following legislation must be adhered to when eye/face protection is worn in Scottish health and care settings: • The Health and Safety at Work etc. Act 1974 • The Management of Health and Safety at Work Regulations 1999 • The Control of Substances Hazardous to Health (Amendment) Regulations 2004 • The Personal Protective Equipment at Work (Amendment) Regulations 2022 (PPER 2022)	Recommendation
GPP3.1 Eye/face protection intended for use in health and care settings should meet the relevant standards as detailed in Appendix 2 of the literature review.	Good Practice Point

3.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
R3.1 Adhering to current legislation and regulations allows compliance with associated corporate and social governance responsibilities, including the legal requirements of the applicable health and safety management policy. R3.2 No benefits to note.

Benefits
GPP3.1 Ensuring eye/face protection meets industry standards will allow for standardisation when purchasing eye/face protective equipment. GPP3.1 Ensuring eye/face protection meets industry standards provides assurance of the quality of eye/face protective equipment. GPP3.1 Ensuring eye/face protection meets industry standards may result in increased user confidence in eye/face protective equipment.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
R3.1 No harms anticipated. R3.2 No harms anticipated. GPP3.1 None of the standards identified are specific to health and care settings and all have been developed by technical committees whose membership is unknown. Test methods provided by these standards are generalised to apply to any occupational hazard. For example, where sample detection solutions and/or gases are used, these may not accurately mimic potentially infectious particles encountered in health and care settings. Therefore, it is possible that the current performance requirement tests for eye/face protective equipment in general may not be appropriate for health and care settings.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
R3.1 Only benefits identified. R3.2 Only benefits identified. GPP3.1 Although it is possible that the current performance requirement tests for eye/face protective equipment in general may not be appropriate for health and care settings, there are no other standardised performance tests available at this time. Therefore, the benefits currently outweigh the potential harms.

3.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context?

Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
R3.1, R3.2, and GPP3.1 No additional resources or feasibility issues are expected as a result of adhering to relevant legislation and standards. However, there may be financial implications if current stock of eye/face protection is non-compliant with industry standards and repurchasing is required.

3.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
R3.1 The evidence underpinning this recommendation is mandatory legislation and is therefore sufficient. No expert opinion to note.

Expert opinion
R3.2 The evidence underpinning this recommendation is mandatory legislation and is therefore sufficient. No expert opinion to note. GPP3.1 Despite their low quality (Level 4, expert opinion) British, European and International standards are considered best practice in UK industry settings, therefore ARHAI Scotland and its stakeholders support their use.

3.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

3.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/ religious reasons

Intentional vagueness
None.

3.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

3.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
There are no specific standards or legislation for eye/face protection worn in health and care settings. • Expansion of current general legislation on the appropriate use of PPE for IPC within health and care settings would be beneficial. • Expansion of standards pertaining to eye/face protection against infectious particles would be beneficial.

Research question 4: When should eye/face protection be worn by health and care staff?

Part A: Quality of evidence

4.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
In total, 41 pieces of evidence were included to answer this research question. Twelve pieces of evidence were identified in previous version(s) of this literature review,[1, 4, 8, 11-13, 39-44] and 29 pieces of evidence were identified during this update.[2, 3, 5-7, 10, 14, 15, 17-21, 23-25, 45-57] Of this evidence, 36 documents were graded SIGN50 Level 4 expert opinion,[2-8, 10, 12-15, 17-20, 23-25, 39, 40, 43, 44, 46, 48-57] including one technical report, [47] and one British Standard.[11] Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is often a lack of supporting evidence and an unclear, methodology for formulating the guidance. Three SIGN50 Level 3 experimental studies were included.[41, 42, 45] Two guidelines were graded AGREE: 'Recommend with modifications'.[1, 21] These guidelines carried out a systematic review of primary evidence, however aspects of the methodology such as the search strategies used, were not provided. Additionally, whilst both provided some discussion of the evidence, there was a lack of	36 x SIGN50 Level 4, expert opinion 3 x SIGN50 Level 3 2 x AGREE: Recommend with modifications

Comments	Evidence level
referencing amongst the evidence base underpinning some recommendations regarding eye/face protection, which made it difficult to establish a clear link between these and the supporting evidence.[1, 21]	

4.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
Selection of the type of eye/face protection, consistencies in the evidence: • There is consistency amongst the evidence (one WHO AGREE: 'Recommend with modifications' guideline and three SIGN50 Level 4) that selection of the type of eye/face protection may require a risk assessment.[4, 7, 11, 21] • There is consistency amongst five SIGN50 Level 4 expert opinion guidance documents that the following considerations before selecting a certain type of eye/face protection should be made: the appropriateness for the task,[4, 13, 15, 40, 50] the type of anticipated exposure,[4, 13, 15] and the fit of the eye/face protection.[15, 50] • Other considerations provided, of which only one SIGN50 Level 4 guidance document suggests this, include the setting in which the healthcare worker is working,[15] individual preference,[15] local policy, and availability.[4] • BS EN 7028:1999 (graded SIGN50 Level 4) states style selection should be based on the performance requirements, decided based on a risk assessment.[11] However, this standard does not provide clear guidance

Comments

on the types of eye/face protection appropriate for tasks/anticipated exposure within health and care settings.

There is a lack of consistency amongst the SIGN50 Level 4 expert opinion guidance on the capabilities of goggles, face shields and safety glasses:

- Some guidance states that face shields can be worn in place of goggles[13, 15] or safety glasses[15].
- Whereas, other guidance, including the British Standard 7028:1999, claim they do not offer the same levels of protection.[11, 20]
- Face shields are said to provide protection to the eyes and face, whereas goggles[3, 11, 13] and safety glasses[3, 11] are said to provide protection to the eyes only.
- One guidance document applicable to Australian health and care settings, does not consider safety glasses as adequate eye protection unless they are of the wrap around type.[15]
- The Association for Surgical Technologies (AST) state face shields offer secondary protection only, with goggles offering primary protection.[8]
- No extant guidance provides information regarding which type(s) of safety glasses are most appropriate for certain tasks/anticipated exposures.

Protection against splash and spray

- There is consistency amongst the UK epic3[1] and WHO[21] guidelines, both graded AGREE: 'Recommend with modifications', and 22 SIGN50 Level 4 expert opinion guidance documents that eye/face protection should be worn if there is an anticipated risk of splashing or spraying of blood or body fluids,[2-7, 12-14, 18, 19, 23, 24, 39, 40, 43, 44, 50, 51, 53, 55, 56] often recommended as part of standard precautions.[2-4, 7, 13, 21, 23, 43, 50]
- Three SIGN50 Level 4 expert opinion guidance documents recommended wearing of eye/face protection during manual cleaning and decontamination of medical equipment[3, 6, 14] specifically re-usable

Comments

medical devices,[3] medical/surgical supplies and equipment,[14] and patient care items[6] due to the likelihood of splashing or spraying.[6]

- There is consistency amongst one AGREE: 'Recommend with modifications' guideline and four SIGN50 Level 4 expert opinion documents that a risk assessment for splashing or spraying during a care procedure should be carried out.[2, 3, 7, 21, 24]
    - A range of potential procedures and patient care activities for assessment are cited. These include dental, surgical, invasive, and diagnostic procedures.
    - No specific information is provided within the included literature on how to carry out said risk assessments.

Regarding the specific type of eye/face protection most suitable for protection against splash and spray:

- The included evidence often does not state the type(s) of eye/face protection suitable when recommending eye/face protection be worn against splashing and spraying. Where types of eye/face protection are provided within the literature, these are given as non-exhaustive examples.
- No high-quality primary evidence was included that assessed effectiveness of different types of eye/face protection.
    - Only one low-quality experimental simulation study, graded SIGN50 Level 3, was included.[42] This investigated the effectiveness of five types of eye/face protection (modern prescription glasses, standard surgical telescopic loupes, hard plastic contoured glasses, disposable plastic glasses, and a combination facemask with eye shield) against conjunctival contamination during a femoral osteotomy procedure using a cadaveric leg.[42] All types were associated with a statistically significant reduction in exposure to splash contamination on the simulated conjunctival target of the manikin ($p<0.05$), except the prescription glasses ($p=0.73$), when

Comments

comparing with no eye/face protection.[42] Disposable plastic glasses (providing above, below and contoured side protection) were identified to be most effective, with a 96% reduction in contamination (95% CI 62%-98%), and significantly more effective than standard loupes ($p<0.05$) and the combination facemask with eye shield ($p=0.02$).[42]
 	
• Goggles for splash and spray – inconsistencies in extant guidance
  ○ There was consistency amongst three SIGN50 Level 4 expert guidance documents that indirectly vented goggles, with a manufacturers anti-fog coating, provide the most reliable protection from splashing and spraying[3, 8, 13] at multiple angles.[3, 13] The HSE state protection is offered at multiple angles due to the complete rim of the goggles being in contact with the face.[20] Directly vented goggles are said to potentially allow for the entrance of splashes and spray into the goggles.[8]
  ○ The British Standard 7028:1999 suggests goggles (and safety glasses) are ineffective against 'liquid splashing', defined as occurring with a splash of liquid, and only face shields are appropriate as they offer protection to the face.[11]
 	
• Face shields for splash and spray – consistencies in the extant guidance
  ○ There is consistency amongst the evidence (six SIGN50 Level 4) that face shields are suitable for wearing when splash or spray is anticipated.[11, 15, 39] Face shields that extend from chin to crown,[3, 11] below the chin to the ears,[15] and wrap around the sides[13] are said to provide better protection against splashes or sprays. The AST and Australian Government aligns with this concept, stating face shields with openings at the bottom[8] and gaps around the sides[15] are unable to provide protection.[8]
 	
• Only one piece of SIGN50 Level 4 expert opinion guidance by the AST commented on the effectiveness of surgical face masks with integrated

Comments

face shields, stating they are not able to provide 'optimal protection'.[8] Within this document, 'optimal protection' is described to be offered by indirectly vented goggles to protect from splashes, sprays, respiratory droplets, and debris. Therefore, it is implied that surgical face masks with integrated face shields are deemed ineffective against these exposure types.[8]

Additional wearing of eye/face protection

'Droplet precautions':

- Four SIGN50 Level 4 expert opinion documents recommend eye/face protection should be worn as part of droplet precautions.[24, 50, 52, 55]
- One piece of SIGN50 Level 4 expert opinion guidance published by the Centers for Disease Prevention and Control (CDC) states that a recommendation could not be formed regarding routine use of eye protection in addition to a mask when in close contact with patients requiring 'droplet precautions', due to insufficient evidence or lack of consensus regarding efficacy.[13]
- There is no consistency within the extant guidance regarding the specific type of eye/face protection that should be worn for 'droplet precautions'. Where types of eye/face protection are provided, these are given as non-exhaustive examples.
    - Two sources (SIGN50 Level 4) discussed possible limitations of face shields including gaps around the sides which may allow for the entry of droplets.[11, 15]
    - Only one piece of SIGN50 Level 4 expert opinion guidance by the AST commented on the effectiveness of surgical face masks with integrated face shields. It is implied surgical face masks with integrated face shields are deemed ineffective against 'respiratory droplets'.[8]

Comments

Protection during aerosol generating procedures:
• There is consistency amongst one AGREE: 'Recommend with modifications' guideline published by the WHO and two expert opinion guidance document graded SIGN50 Level 4, published by the CDC and the UK Department of Health and Social Care (DHSC), state eye/face protection should be worn during aerosol generating procedures (AGPs) on patients with a respiratory infection.[13, 21, 25]
  ○ Five SIGN50 Level 4 expert opinion guidance documents align with this stating eye/face protection should be worn during AGPs on patients with suspected/confirmed COVID-19[47, 49, 54, 57] and influenza.[23]
• One SIGN50 Level 4 expert opinion guidance document recommends the wearing of eye/face protection during all AGPs, regardless of the infectious status of the patient undergoing the procedure, as AGPs generate droplets and splashes alongside aerosols.[12]
• One SIGN50 Level 4 expert opinion document by the UK DHSC states eye/face protection should be worn during AGPs on patients not suspected/confirmed to have an infection spread by the 'aerosol' or 'droplet' route.[2] This may be interpreted as eye/face protection should be worn during all AGPs, however, this may not always apply as it is stated within the document this should be followed with additional infection specific guidance.[2]
• Selection of types of eye/face protection for 'aerosol' exposure:
  ○ The included literature does not provide clear indication of appropriate types of eye/face protection against aerosol exposure. The British Standard 7028:1999 states only goggles are effective against 'liquid droplets', defined as in the form of an 'aerosol or mist', as they enclose the orbital cavities.[11] The HSE suggest directly vented goggles may allow for entry of gases, and therefore recommend the wearing of indirectly vented goggles.[20]

Comments

- No high-quality primary evidence was included that assessed effectiveness of different types of eye/face protection against aerosol exposure. Two experimental simulation studies, graded SIGN50 level 3, were included.[41, 45] Both compared eye/face protection against no eye/face protection. The first study compared two types of face shields (open vented compared with enclosed) the second study only evaluated one type of face shield. Both studies identified a statistically significant reduction in exposure to the particles (released at 46cm $p<0.01$,[41] and up to 100cm $p<0.0001$)[45] from the source. No statistically significant difference was identified between the open vented and enclosed face shield types, compared within the first study.[45]

Protection against specific infectious agents:

- Ten expert opinion guidance documents[3, 7, 17, 24, 25, 44, 46, 48, 49, 55] and one guideline graded AGREE: 'Recommend with modifications', recommend the wearing of eye/face protection when caring for patients with certain or potential infections.[21]
- The WHO guideline graded AGREE: 'Recommend with modifications', recommends wearing eye/face protection when caring for patients with novel influenza (such as avian influenza), SARS and novel acute respiratory infection (ARI).[21] Two SIGN50 Level 4 expert opinion guidance documents align with this for SARS and pandemic influenza.[3, 44]
- There is consistency amongst the evidence base (four SIGN50 Level 4) regarding wearing eye/face protection when caring for patients with suspected/confirmed SARS-CoV-2.[17, 18, 24, 49]
- Only one SIGN50 Level 4 expert opinion guidance document was identified for each of the following additional infections: viral haemorrhagic fever (VHF),[3] respiratory syncytial virus (RSV),[46] mpox[48]

Comments

(when showing signs of a lower respiratory tract infection)[55], and any respiratory viral infection.[7, 25, 46]

- One SIGN50 Level 4 guidance document by the Public Health Agency for Canada states eye/face protection is required to be worn by non-immune healthcare workers caring for patients with rubella or mumps.[7]
- The ECDC, CDC, and UK DHSC (three SIGN50 Level 4) recommend healthcare workers involved in environmental cleaning (including of autopsy rooms/ anterooms)[18] of patients' rooms with acute respiratory infections, including COVID-19,[25] and waste management of COVID-19[49] infected patients should wear eye protection.[18, 25, 49]

Extended use

- There is consistency amongst the literature (four SIGN50 Level 4) regarding extended use of PPE, also referred to within the literature as sessional or continuous use, being defined as the wearing of PPE for care of successive patients without removal between each patient.[7, 15, 19, 50]
- Four SIGN50 Level 4 expert opinion guidance documents are consistent in recommending that eye/face protection is suitable for extended use,[7, 15, 19, 50]
- One piece of general expert opinion guidance (SIGN50 Level 4) for health and care settings states this is often appropriate within cohort settings when caring for patients with the same microorganisms.[7]

Source control

- There was a lack of evidence identified regarding the use of eye/face protection for source control. Only one SIGN50 Level 4 expert opinion guidance document by the CDC stated face shields alone are not recommended to be used as source control.[19]

4.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows: • UK (n=14)[1, 2, 4, 11, 12, 20, 23, 25, 43, 51-53, 55, 56] • USA (n=13)[6, 8, 13, 14, 17-19, 39-42, 44, 54] • Australia (n=3)[3, 15, 45] • Canada (n=1)[7] • New Zealand (n=2)[10, 50] • Europe/EU/EEA (n=4)[46-49] • International (n=4)[5, 21, 24, 57] Guidance published by the ECDC (n=4) applies to the European Union (EU)/European Economic Area (EEA) and is directly applicable to Scottish health and care settings. Three expert opinion guidance documents and one AGREE: 'Recommend with modifications' guideline published by the WHO applies internationally[5, 21, 24, 57] This is applicable to a lesser extent to Scottish health and care settings, although more generalised and can therefore be adapted. Twelve expert opinion guidance documents[2, 4, 12, 23, 25, 43, 51-53, 55, 56] and one guideline[1] were published within the UK, and are directly applicable to Scottish health and care settings. One guidance document and one British Standard were published within the UK but apply to a wide range of occupations, however, are more generalised and can be adapted.[11] Three experimental simulation studies were carried out in the following countries: Australia (n=1),[45] and the USA (n=2).[41, 42] All studies were carried out in-vitro using

Comments
manikins, differences in the controlled conditions of the studies may lack applicability to Scottish health and care settings. The eye/face protective equipment used within these studies should also be considered, they may not be the of the same style/type/manufacturer as those used within the UK.

4.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
As all primary research studies included within this research question were experimental simulation studies, there is limited generalisability out with their controlled settings. Manikins were used in place of human participants, of which they varied in size/style, therefore findings may lack validity outside of the in-vitro experimental settings. All studies were performed to simulate adult ‘patients’ and did not consider differences with children/neonates.

4.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
The primary evidence identified is particularly at risk of publication bias. Studies that found non-significant differences in effectiveness and between different types of eye/face protection may not have been published, which may bias the conclusions drawn.

Part B: Evidence to decision

4.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
R4.1 Eye/face protection should be worn when there is an anticipated risk of splashing and/or spraying of blood or body fluids.	Recommendation
GPP4.1 Extended use of eye/face protection (worn for care of successive service users without removal between) should be applied during cohort isolation only.	Good Practice Point
GPP4.2 The following factors should be considered when deciding what type of eye/face protection to wear: • the appropriateness for the task being undertaken, • the type of anticipated exposure, • and the fit of the eye/face protection.	Good Practice Point

4.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
R4.1 Wearing eye/face protection when there is anticipated risk of splashing or spraying reduces the risk of transmission of infectious agents. GPP4.1 Extended use of eye/face protection during cohorting of service users allows for care of successive service users without the interruption of donning and doffing until the eye/face protection needs changed or removed. Thus, reducing the risk of cross contamination of infectious agents. GPP4.2 Selecting the type of eye/face protection based on the appropriateness for the task, anticipated exposure, and fit of the eye/face protection reduces the risk of transmission of infectious agents by ensuring the optimal protection is offered to the wearer.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
R4.1, GPP4.1, and GPP4.2 Wearing of eye/face protection may impair wearers visibility, for example due to fogging when corrective spectacles are worn.

Risks and harms
R4.1 and GPP4.1 Wearing of eye/face protection may result in occupational health issues, for example skin irritation or headaches due to band retention or weight of the eye/face protection. GPP4.2 No harms anticipated.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/ Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
R4.1 and GPP4.1 Although the wearers visibility may be impaired and occupational health issues may present when wearing eye/face protection, the benefit of reduced risk of transmission of infectious agents outweighs the harms. GPP4.2 Only benefits identified.

4.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
R4.1 and GPP4.1 Wearing of some types of eye/face protection may have an impact on the ability to undertake certain health and care procedures. For example, in surgery where some instruments (such as telescopic loupes) are required but are not compatible with the eye/face protection.

Feasibility
GPP4.1 There will be resource implications related to staff education and training to support appropriate selection of eye/face protection by the wearer.

4.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
R4.1 Two guidelines graded AGREE: ‘Recommend with modifications’[1, 21] and 22 SIGN50 Level 4 expert opinion guidance documents support this recommendation.[2-7, 12-14, 18, 19, 23, 24, 39, 40, 43, 44, 50, 51, 53, 55, 56] Therefore, the evidence is sufficient to support this recommendation, no expert opinion to note. GPP4.1 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection is suitable for extended use[7, 15, 19, 50] during cohort isolation.[7] GPP4.2 ARHAI Scotland and its stakeholders support extant expert opinion that selection of the type of eye/face protection should be based on several factors which include the appropriateness for the task,[4, 13, 15, 40, 50] the type of anticipated exposure,[4, 13, 15] and the fit of the eye/face protection.[15, 50]

4.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

4.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/religious reasons

Intentional vagueness
None.

4.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

4.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
R4.1, GPP4.1, and GPP4.2 High quality primary research investigating the effectiveness of different types of eye/face protection against different types of anticipated exposures would be beneficial to establish which is/are most effective against common exposure types occurring within health and care settings. In

Recommendations for research
particular there is a need for research investigating the risk of ocular exposure to infectious aerosols.

Research question 5: When should eye/face protection be worn by a service user/visitor?

Part A: Quality of evidence

5.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
Three SIGN50 Level 4 expert opinion guidance documents were included,[6, 7] including one British Standard.[11] Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is often a lack of supporting evidence and a lack of, or unclear, methodology for formulating the guidance. No primary evidence was identified for this research question. This research question was added during this literature review update.	3 x SIGN50 Level 4, expert opinion

5.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
Of the three SIGN50 Level 4 guidance documents identified, each covered a different point which are considered below.

Comments
• Within guidance written by the CDC it was noted patients may wear eye protection to protect from spatter or debris during dental procedures.[6] • Within guidance written by the Public Health Agency of Canada it was noted visitors should have access to the same PPE (including eye/face protection) as health care workers (HCWs) when providing direct patient care. The guidance states that PPE may not be necessary if visitors have been previously exposed to the patient before they were admitted, and PPE may be required for visitors that are visiting multiple patients. Pathogen specific guidance is provided regarding visitors wearing eye/face protection when in prolonged contact with patients under the age of 5 years with suspected or confirmed *Haemophilus influenzae* type B infection, and when around patients with rubella or mumps, where the visitor is non-immune.[7] • BS 7028:1999 recommends the provision of eye protection for visitors within all occupational settings.[11] In conclusion, the small evidence base identified for this research question varies in content provided, therefore it is not possible to determine consistency. Whilst the British Standards Institution (BSI) recommend the provision of eye protection for visitors within all occupational settings, this may not be applicable to health and care settings due to variation within practice and exposure scenarios.

5.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows:

Comments
• UK (n=1)[11] • USA (n=1)[6] • Canada (n=1)[7] Despite the British Standard being directly applicable to Scotland, the standard is applicable more generally to eye and face protection worn in all occupational settings and therefore is not specific to infection prevention and control for health and care settings.[11] Evidence published in the USA and Canada is specific to health and care settings within these countries.[6, 7]

5.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

5.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

5.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
GPP5.1 Visitors should be offered eye/face protection when visiting or providing direct care if splashing and/or spraying is anticipated.	Good Practice Point

5.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
GPP5.1 Provision of eye/face protection to visitors when providing direct service user care offers protection against anticipated exposure to potentially infectious agents from blood and body fluids.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
GPP5.1 The wearing of eye/face protection by a visitor may impair vision, for example due to fogging.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
GPP5.1 Although there is a risk visitors’ vision may be impaired by wearing eye/face protection, protection is offered against anticipated exposure to potentially infectious agents from blood and body fluids. Therefore, the benefits outweigh the potential harms.

5.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
GPP5.1 Provision of eye/face protection to visitors may have financial implications as this may require purchasing of additional eye/face protection. GPP5.1 Consideration by staff to establish if eye/face protection should be offered/provided to a visitor may have resource implications. GPP5.1 The explanation by staff to visitors regarding all aspects of wearing eye/face protection may have resource implications. This includes why eye/face protection is required, selection of certain types, where and how this should be donned/doffed, when this should be changed/removed, and where to place or dispose of used eye/face protection.

5.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
GPP5.1 ARHAI Scotland and its stakeholders support expert opinion guidance (by the Public Health Agency of Canada and the British Standards Institution) that visitors should be offered eye/face protection when providing direct patient care.[7, 11] It is the expert opinion of ARHAI Scotland and its stakeholders that eye/face protection should be offered when providing direct service user care if splashing and/or spraying of blood or body fluids is anticipated.

5.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

5.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point; if none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/ religious reasons

Intentional vagueness
None.

5.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

5.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
None.

Research question 6: Where and how should eye/face protection be donned (put on)?

Part A: Quality of evidence

6.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
In total, 27 pieces of evidence were included to answer this research question. Six pieces of evidence were identified in previous version(s) of this literature review,[8, 9, 12, 13, 36, 58] and 21 were identified during this update.[3, 7, 10, 15, 20, 23, 25, 38, 56, 59-65 21, 66-69] No primary evidence was included within this research question. Two pieces of legislation, the Personal Protective Equipment at Work (Amendment) Regulations and the Control of Substances Hazardous to Health (Amendment) Regulations (COSHH), were identified.[36, 38] All legislation is graded as mandatory. One guideline graded AGREE: 'Recommend with modifications' was included.[21] This was graded AGREE: 'Recommend with modifications' as, whilst this guideline is based on a systematic literature review, some aspects of the methods are not provided, such as the search strategy. The link between recommendations and supporting evidence is unclear. The remaining evidence (n=24) was graded SIGN50 Level 4 expert opinion.[3, 7-10, 12, 13, 15, 20, 23, 25, 56, 58-69]	2 x Mandatory Legislation 1 x AGREE: Recommend with modifications. 24 x SIGN50 Level 4, expert opinion

Comments	Evidence level
Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is often a lack of supporting evidence and a lack of, or unclear, methodology for formulating the guidance.	

6.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
Where should eye/face protection be donned? Four organisations provided recommendations regarding where eye/face protection should be donned: • There is consistency amongst one guideline by the WHO, graded AGREE: 'Recommend with modifications',[21] and nine SIGN50 Level 4 expert opinion guidance pieces, by the UK Health Security Agency (UKHSA) and Australian Commissions, that donning of PPE should be carried out before entering a patients room [15, 56, 59-63, 66, 67] or isolation room/area.[21] • Mortuary care and postmortem examination is considered by one WHO guideline, graded AGREE: 'Recommend with modifications'. This recommends donning of PPE takes place in the 'dress in' room, outside of the autopsy room.[21] • One guidance document by the WHO, graded SIGN50 Level 4 expert opinion, recommends donning of PPE should take place within a 'clean area' at the entrance of an isolation unit.[69] No definition of a 'clean area' is provided and it is also unclear if the donning of PPE is recommended before or after entering the isolation unit.[69]

Comments

How should eye/face protection be donned?

Sequence

- Prior to donning eye/face protection, three SIGN50 Level 4 expert opinion guidance documents state PPE should be visually inspected to ensure there are no damages or defects.[8, 10, 69]
- There is consistency amongst 17 SIGN50 Level 4 expert opinion and one AGREE: 'Recommend with modifications' guideline[21] that eye/face protection should be donned as part of an ensemble in the following order: apron/gown/coveralls (if worn), face mask (surgical face mask or respirator), eye/face protection, then gloves.[3, 7, 9, 15, 21, 23, 56, 58-64, 66-69]
- There is consistency amongst 11 SIGN50 Level 4 guidance documents that hand hygiene should be performed prior to donning PPE.[3, 7, 15, 59-64, 68, 69]

Fit of eye/face protection

- Extant guidance was consistent with COSHH legislation regarding fit of eye/face protection:
  - The COSHH legislates, "Every employer who provides any control measure, other thing or facility in accordance with these Regulations shall take all reasonable steps to ensure that it is properly used or applied as the case may be."[36] This is interpreted by HSE guidance, graded SIGN50 Level 4 expert opinion, published to support the implementation of COSHH legislation, to mean PPE should be worn correctly and in accordance with the manufacturer's instructions.[65] And is supported in three pieces of SIGN50 Level 4 expert opinion guidance.[7, 8, 12]
- There is consistency amongst five SIGN50 Level 4 expert opinion guidance documents that eye/face protection should be adjustable to ensure a proper fit[8, 13, 67] and fit snug/closely across the brow.[3, 8, 15]

Comments
• Only one SIGN50 Level 4 guidance document by the ECDC state goggles must fit the users' facial features and must be properly positioned to fit well.[9] • Only one SIGN50 Level 4 guidance document by the UK DHSC provides guidance on wearing eye/face protection once donned. They recommend eye/face protection should not be worn around the neck or on top of the head when not in use.[25] Compatibility • The HSE guidance documents (SIGN50 Level 4) published to support compliance with COSHH[36] and PPER[38] legislation, state where two or more items of PPE are worn, the items must be compatible with each other.[20, 65] HSE provide the following example, where a half-mask respirator may not be compatible with a pair of goggles.[20]

6.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows: • UK (n=12)[12, 20, 23, 25, 36, 38, 56, 64-68] • USA (n=3)[8, 13, 58] • Australia (n=7)[3, 15, 59-63] • Canada (n=1)[7] • New Zealand (n=1)[10]

Comments
• Europe/EU/EEA (n=1)[9] • International (n=2)[21, 69] Guidance published by the ECDC (n=1) applies to the European Union (EU)/European Economic Area (EEA) and is directly applicable to Scottish health and care settings.[9] Guidance published by the WHO (n=2) applies internationally.[21, 69] This is applicable to a lesser extent to Scottish health and care settings, although more generalised and can therefore be adapted. Legislation identified is directly applicable to Scotland, however no legislation identified is specific to health and care settings.[36, 38] Expert opinion documents (n=10) published within the UK are directly applicable to Scottish health and care settings.[12, 23, 25, 56, 64, 66-68] Except two published within the UK that apply to a wide range of occupations however, are more generalised and can be adapted.[20, 65]

6.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

6.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

6.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
R6.1 Where two or more items of PPE are worn, these must be compatible with one another.	Recommendation
GPP6.1 Eye/face protection should be checked for any damage or defects prior to donning (putting on).	Good Practice Point
GPP6.2 Eye/face protection should be donned (put on) outside of the service user's room/care area, or within an ante room.	Good Practice Point
GPP6.3 Hand hygiene should be performed prior to donning (putting on) eye/face protection, or all PPE when worn as part of an ensemble.	Good Practice Point

Recommendation	Grading
GPP6.4 When eye/face protection is being worn as part of a PPE ensemble, eye/face protection should be donned (put on) after a surgical face mask or respirator and before donning gloves.	Good Practice Point
GPP6.5 Eye/face protection should be worn in accordance with manufacturer's instructions, including use within expiration dates.	Good Practice Point
GPP6.6 Once donned (put on), eye/face protection should not be touched or worn around the neck or on top of the head when not in use.	Good Practice Point

6.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
R6.1 Wearing PPE items that are compatible with each other ensures the level of protection offered is not compromised. GPP6.1 Checking eye/face protection for any defects or damage ensures the full protection offered is provided. GPP6.2 Donning (putting on) eye/face protection outside of a service user's room, care area, or within an ante room will ensure that protection is in place on entry to the room/space allowing the HCW to commence care immediately.

Benefits
GPP6.3 Performing hand hygiene before donning (putting on) eye/face protection reduces the risk of cross contamination of infectious agents from the wearer's hands. GPP6.4 Donning (putting on) eye/face protection in the recommended sequence minimises the risk of potential contamination with infectious agents, particularly when donning sterile items of PPE as part of this ensemble. GPP6.4 Donning (putting on) eye/face protection in the recommended sequence ensures this is donned without interference from other items of PPE. GPP6.5 Wearing eye/face protection in accordance with manufacturer's instructions, including within its expiration date, ensures the item is being worn as intended and the full protection offered is provided, reducing the risk of transmission. GPP6.6 Not touching eye/face protection external surfaces once donned (put on), or wearing this around the neck or on top of the head when not in use, reduces risk of cross transmission of infectious agents.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks/harms
R6.1, GPP6.1, GPP6.2, GPP6.3, GPP6.4, GPP6.5, and GPP6.6 No harms anticipated.

Benefit-harm assessment

Classify as "benefit outweighs harm" (or vice versa) or a "balance of benefit and harm." Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
R6.1, GPP6.1, GPP6.2, GPP6.3, GPP6.4, GPP6.5, and GPP6.6 Only benefits identified.

6.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
R6.1 There may be a requirement to purchase additional stock to ensure that PPE items are compatible when worn together. GPP6.2 There may not be clearly defined areas for donning (putting on) eye/face protection in all Scottish health and care settings. Local factors may impact this (space availability, location of storage of eye/face protection, ergonomics, room layout) which will require local decision-making. Staff resource may be required to support this. GPP6.5 There will be resource implications related to staff education and training regarding wearing eye/face protection in accordance with manufacturer's instructions. Particularly if more than one type/style of eye/face protection is available. GPP6.6 There may be a requirement for staff resource and education regarding the correct wearing of eye/face protection and to support adherence to not touching or wearing eye/face protection around the neck or on top of the head when not in use.

6.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
R6.1 Two pieces of mandatory legislation, COSHH[36] and PPER,[38] and two pieces of supporting SIGN50 level 4 expert opinion by the HSE underpin this recommendation.[20, 65] Therefore, the evidence is sufficient to support this recommendation, no expert opinion to note. GPP6.1 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection should be visually inspected to ensure no damage or defects are present prior to donning (putting on) this item of PPE.[8, 10, 69] GPP6.2 This good practice point on donning (putting on) eye/face protection outside of the service user’s room/care area, or within an ante room, is informed by one acute respiratory infection specific (ARI) WHO guideline graded AGREE: ‘Recommend with modifications’,[21] and nine SIGN50 Level 4 expert opinion guidance pieces.[15, 56, 59-63, 66, 67] This evidence was considered insufficient for a recommendation due to the narrow scope of the WHO AGREE-graded guideline and limitations of SIGN50 Level 4 evidence, therefore a good practice point was developed. GPP6.3 ARHAI Scotland and its stakeholders support 11 SIGN50 Level 4 expert opinion pieces that hand hygiene should be performed prior to donning (putting on) eye/face protection, or all PPE when worn as part of an ensemble.[3, 7, 15, 59-64, 68, 69] GPP6.4 This good practice point on donning (putting on) eye/face protection after a surgical face mask or respirator and before donning gloves is informed by one ARI-specific WHO guideline graded AGREE: ‘Recommend with modifications’[21] and 17 SIGN50 Level 4 expert opinion pieces.[3, 7, 9, 15, 21, 23, 56, 58-64, 66-69] This evidence was considered insufficient for a recommendation due to the narrow

Expert opinion
scope of the WHO AGREE-graded guideline and limitations of SIGN50 Level 4 evidence, therefore a good practice point was developed. GPP6.5 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection should be worn in accordance with manufacturer's instructions to ensure each type/style of eye/face protection is worn correctly.[7, 8, 12, 65] It is the expert opinion of ARHAI Scotland and its stakeholders that eye/face protection should be worn within the item's expiration date. GPP6.6 It is the expert opinion of ARHAI Scotland and its stakeholders that external surfaces of eye/face protection should not be touched once donned (put on) to reduce the risk of cross contamination of potentially infectious agents. ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection should not be worn around the neck or on top of the head when not in use.[25]

6.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state "none". Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

6.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state "none". Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence

- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/religious reasons

Intentional vagueness
None.

6.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

6.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
GPP6.2 Further research is required to fully understand the transmission risks associated with donning (putting on) eye/face protection within a service user's room/care area.

Research question 7: Where and how should eye/face protection be doffed (taken off)?

Part A: Quality of evidence

7.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
In total, 28 pieces of evidence were included to answer this research question. Seven pieces were identified in previous version(s) of this literature review,[1, 8, 9, 12, 13, 36, 58] and 21 were identified during this update.[3, 6, 7, 15-17, 21, 23, 25, 56, 59-64, 69-73] No primary evidence was included within this research question. One piece of legislation, the Control of Substances Hazardous to Health (Amendment) Regulations (COSHH), was included.[36] All legislation is graded as mandatory. Two guidelines graded AGREE: 'Recommend with modifications'[1, 21] were included. These guidelines carried out a systematic review of primary evidence, however aspects of the methodology such as the search strategies used, were not provided. Additionally, whilst both provided some discussion of the evidence, there was a lack of referencing amongst the evidence base underpinning some recommendations regarding eye/face	1 x Mandatory Legislation 2 x AGREE: Recommend with modifications 25 x SIGN50 Level 4, expert opinion

Comments	Evidence level
protection, which made it difficult to establish a clear link between these and the supporting evidence.[1, 21] The remaining evidence (n=25) was graded SIGN50 Level 4 expert opinion.[3, 6-9, 12, 13, 15-17, 23, 25, 56, 58-64, 69-73] Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is often a lack of supporting evidence/referencing and a lack of, or unclear, methodology for formulating the guidance.	

7.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments

Where should eye/face protection be doffed?
 	
• COSHH legislates, "Personal protective equipment which may be contaminated by a substance hazardous to health shall be removed on leaving the working area and kept apart from uncontaminated clothing and equipment."[36] The WHO guideline graded AGREE: 'Recommend with modifications' and an expert opinion guidance document by the UK DHSC align with this.[21, 25]
 	
• There is inconsistency within the literature regarding whether eye/face protection should be doffed before or after leaving a patient area.
 	
  ○ Nine SIGN50 Level 4 expert opinion guidance pieces state this should be doffed before leaving a patient area.[6, 12, 16, 23, 58, 61, 62, 70, 71]
  ○ Eight SIGN50 Level 4 expert opinion guidance pieces recommend doffing of eye/face protection after leaving a patient area[3, 15, 56, 59, 60, 63, 72, 73] or, where possible, in an ante-/side room.[70, 72, 73]

Comments

- Additionally, two SIGN50 Level 4 expert opinion pieces specify eye/face protection should be doffed at least two meters away from the patient, one of these documents is written for HCWs caring for patients with suspected/confirmed COVID-19.[64, 70]

- The WHO guideline, graded AGREE: 'Recommend with modifications', provides guidance for doffing PPE to those undertaking mortuary or post-mortem examination, which state this should take place in the designated 'dress out room'.[21]
- The CDC interim recommendations for HCWs during COVID-19 provide SIGN50 Level 4 expert opinion guidance to ambulatory staff which states eye/face protection should be removed prior to entering the drivers compartment, if they were involved in direct patient care, to avoid contamination.[17]

How should eye/face protection be doffed?

- Doffing sequence
  - Twenty of the 28 documents identified, including one AGREE: 'Recommend with modifications' guideline by the WHO,[21] provide guidance on a PPE doffing sequence to avoid cross-contamination.[1, 3, 7, 9, 12, 15, 23, 56, 58-64, 69-71, 73]
  - There is general consistency in the literature (one WHO AGREE:' Recommend with modification' guideline and 17 SIGN50 Level 4) that eye/face protection should be removed after the doffing of gloves and doffing of a gown/apron/coverall,[1, 3, 7, 9, 12, 21, 23, 56, 58, 60, 61, 63, 64, 70, 71, 73] but before doffing a face mask[1, 3, 7, 9, 21, 23, 56, 58-64, 70, 71, 73] (often specified as a surgical face mask or respirator,[1, 7, 9, 21, 23, 56, 58-60, 63, 71, 73] depending on the anticipated type of exposure), if these items of PPE have been worn.
  - One guidance document by the CDC, graded SIGN50 level 4 expert opinion, provides two PPE doffing sequence examples, one example aligns with this sequence, the second places doffing eye/face

Comments
protection after gloves and before an apron/gown. It is unclear why two sequence examples are provided.[58] ○ Seven SIGN50 Level 4 expert opinion guidance pieces state hand hygiene should be performed before and after removing eye/face protection (specifically after doffing a gown/apron/coveralls and before doffing a face mask).[7, 60-64, 70] ○ The WHO guideline, graded AGREE: 'Recommend with modifications', recommends hand hygiene be performed before doffing eye/face protection and after all other items of PPE are doffed (specifically a face mask).[21] ○ The epic3 guideline, graded AGREE: 'Recommend with modifications', and 14 SIGN50 Level 4 guidance documents partially align with this in regard to performing hand hygiene after doffing all PPE.[1, 3, 7, 23, 58-64, 69-71, 73] In a guidance document by the CDC, they recommend performing hand hygiene after doffing eye/face protection, only if contamination of the hands occurs.[58] ○ One evidence piece provided by the WHO, graded SIGN50 Level 4 expert opinion, provides a more extensive sequence for doffing PPE. This aligns with other literature in that eye/face protection should be doffed after an apron, and before a face mask, however, recommends hand hygiene be performed on gloved hands, the outer gloves removed, and hand hygiene performed once again on gloved hands before and after the removal of the head/neck covering, then gown and then eye/face protection.[69] • Doffing technique ○ Fourteen SIGN50 Level 4 expert opinion pieces provide guidance on the technique for doffing eye/face protection to minimise risk of cross-contamination. ○ There is consistency amongst the literature (14 SIGN50 Level 4) that the outside of the eye/face protection is considered to likely be contaminated, and therefore the eye/face protection should be

Comments

removed by handling only the part that secures it to the wearers head (such as the elastic band, ties, earpieces, headband, or side arms).[3, 7-9, 12, 13, 15, 23, 58, 64, 69-71, 73]

- UKHSA, the WHO and the CDC expert opinion documents (five SIGN50 Level 4) recommend the wearer uses two hands to handle the straps, pulling both behind and away.[58, 69-71, 73]
- COSHH legislates, once PPE is removed "The employer shall ensure that the equipment referred to in paragraph (6) [PPE] is subsequently decontaminated and cleaned or, if necessary, destroyed."[36] Six SIGN50 Level 4 guidance documents align with this,[8, 15, 23, 64, 71, 73] and five recommend removed eye/face protection should be placed in a designated container for this.[3, 7, 8, 58, 63]
  - This includes expert opinion guidance published by the AST specifically for surgical personnel. AST recommend that once goggles are removed, they should not be taken outside of the surgery department, and should be placed in a labelled container within the changing/locker rooms ready to be taken for cleaning and disinfection.[8]

7.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments

The country or countries in which the guidance/research was conducted and/or applies to are as follows:

- UK (n=12)[1, 12, 16, 23, 25, 36, 56, 64, 70-73]
- USA (n=5)[6, 8, 13, 17, 58]

Comments
• Canada (n=1)[7] • Australia (n=7)[3, 15, 59-63] • Europe/EU/EEA (n=1)[9] • International (n=2)[21, 69] Guidance published by the ECDC (n=1) applies to the European Union (EU)/European Economic Area (EEA) and is directly applicable to Scottish health and care settings.[9] Guidance published by the WHO (n=2) applies internationally.[21, 69]This is applicable to a lesser extent in Scottish health and care settings, although more generalised and can therefore be adapted. The legislation identified is directly applicable to Scotland, however, is not specific to health and care settings.[36] Expert opinion documents (n=10) published within the UK are directly applicable to Scottish health and care settings.[12, 16, 23, 25, 56, 64, 70-73]

7.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

7.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

7.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
R7.1 Eye/face protection must be doffed (removed) "on leaving the work area", in-line with COSHH legislation. This can be immediately before or after leaving the work area.	Recommendation
GPP7.1 Hand hygiene should be performed before doffing (removing) eye/face protection, and after doffing all other items of PPE when worn as part of a PPE ensemble.	Good Practice Point
GPP7.2 When eye/face protection is worn as part of a PPE ensemble, eye/face protection should be doffed (removed) after the doffing of gloves and doffing of a	Good Practice Point

Recommendation	Grading
gown, apron or coverall, but before doffing a surgical face mask or respirator, to minimise the risk of cross-contamination.	
GPP7.3 Eye/face protection should be removed using two hands and by only handling the part(s) that secure the equipment to the wearers head, for example by the headband or side arms. Eye/face protection with a headband should be removed by using two hands to pull the elastic strap away from behind the wearer.	Good Practice Point
R7.2 Once removed, eye/face protection must be subsequently cleaned/decontaminated or, if necessary, disposed of, in-line with COSHH legislation.	Recommendation
GPP7.4 Reusable eye/face protection should be placed in a designated container for subsequent cleaning and/or decontamination, where necessary.	Good Practice Point

7.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
R7.1 Doffing (removing) eye/face protection immediately before or after leaving the work area minimises the risk of exposure to splash and/or spray of blood and body fluids. GPP7.1 Performing hand hygiene before doffing eye/face protection, and after doffing all PPE when worn as an ensemble, will reduce the risk of cross-contamination of potentially infectious agents. GPP7.2 Doffing PPE in the recommended sequence minimises cross transmission of infectious agents. GPP7.3 Removal of eye/face protection by handling the part(s) that secure to the wearers head reduces the risk of cross-contamination of infectious agents. R7.2 Disposing of, or cleaning/decontaminating used eye/face protection ensures that the item is no longer posing a risk of cross-transmission of infectious agents. GPP7.4 Placing used reusable eye/face protection in a designated container after doffing (removing) minimises the risk of cross contamination of infectious agents with the surrounding environment.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
R7.1, GPP7.1, GPP7.2, GPP7.3, R7.2, GPP7.4 No harms anticipated.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
R7.1, GPP7.1, GPP7.2, GPP7.3, R7.2, GPP7.4 Only benefits identified.

7.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
R7.1 There may not be clearly designated areas for doffing (taking off) eye/face protection in all Scottish health and care settings. Local factors may impact this (space availability, ergonomics, and room layout) which will require local decision-making. Staff resource may be required to support this. R7.1 and GPP7.1 Provision of waste receptacles, designated containers for subsequent cleaning, and hand hygiene facilities near areas for doffing (removing) eye/face protection will be required, local factors may impact this (space availability, ergonomics, and room layout).

7.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
R7.1 The evidence regarding doffing (removing) eye/face protection on leaving a work area is from COSHH legislation that is mandatory. The evidence around whether eye/face protection should be doffed before or after leaving the work area was inconclusive. The COSHH legislation allows for either, and therefore it is the expert opinion of ARHAI Scotland and its stakeholders that both scenarios are

Expert opinion

appropriate as this will not prevent adherence to the ensemble removal sequence, and account for differences in local factors (space availability, ergonomics, and room layout).

GPP7.1 One ARI-specific guideline by the WHO graded AGREE: 'Recommend with modifications'[21] and seven SIGN50 Level 4 guidance documents support this good practice point in regards to performing hand hygiene before doffing eye/face protection.[7, 60-64, 70] Two AGREE: 'Recommend with modifications' guidelines (WHO[21]and epic3)[1] and 14 SIGN50 Level 4 expert opinion documents[1, 3, 7, 23, 58-64, 69-71, 73] support this good practice point in regards to performing hand hygiene after doffing all PPE. Seven SIGN50 Level 4 guidance documents suggest performing hand hygiene after doffing eye/face protection.[7, 60-64, 70] It is the expert opinion of ARHAI Scotland and its stakeholders that hand hygiene is performed before doffing eye/face protection and after doffing all PPE, this will cover performing hand hygiene after doffing eye/face protection, unless worn as part of an ensemble. The evidence was considered insufficient for a recommendation due to the narrow scope of the WHO guidelines, and the limitations of both AGREE-graded guidelines, therefore a good practice point was developed.

GPP7.2 This good practice point on doffing (removing) eye/face protection after the doffing of gloves and doffing of a gown, apron or coverall, but before doffing a surgical face mask or respirator is informed by one ARI-specific WHO guideline graded AGREE: 'Recommend with modifications'[21] and 17 SIGN50 Level 4 expert opinion documents.[1, 3, 7, 9, 21, 23, 56, 58-64, 70, 71, 73] The evidence was considered insufficient for a recommendation due to the narrow scope of the WHO guidelines, and limitations of SIGN50 Level 4 evidence, therefore a good practice point was developed.

GPP7.3 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection should be removed by handling only the part(s) that secure the equipment to the wearers head,[3, 7-9, 12, 13, 15, 23, 58, 64, 69-71, 73] using two hands, and by pulling behind and away.[58, 69-71, 73] It is the expert opinion of ARHAI Scotland and its stakeholders that 'pulling behind and away' only applies to eye/face protection with

Expert opinion
a headband. This is required as other part(s), namely the front of the equipment, are likely to be most contaminated by infectious agents.[3, 7-9, 12, 13, 15, 23, 58, 64, 69-71, 73] R7.2 One piece of mandatory legislation by COSHH[36] and six SIGN50 level 4 guidance documents underpin this recommendation.[8, 15, 23, 64, 71, 73] Therefore, the evidence is sufficient to support this recommendation, no expert opinion to note. GPP7.4 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection should be placed in a designated container for cleaning/decontamination,[3, 7, 8, 58, 63] where the eye/face protection is reusable and not damaged.

7.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

7.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations

- economic reasons
- ethical/religious reasons

Intentional vagueness
None.

7.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

7.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
GPP7.3 Further research into methods of removing eye/face protection would be beneficial to establish the most effective method to reduce risk of cross contamination of infectious agents.

Research question 8: When should eye/face protection be changed or removed?

Part A: Quality of evidence

8.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
Eight pieces of evidence were identified to answer this research question. Of these, one was identified in previous version(s) of this literature review,[12] and seven were identified during this update.[7, 10, 15, 19, 20, 25, 63] All evidence consisted of guidance documents and were graded SIGN50 Level 4 expert opinion due to a lack of scientific evidence to support their recommendations. No primary evidence was included within this research question.	8 x SIGN50 Level 4, expert opinion

8.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
• There is consistency within the literature (four SIGN50 Level 4) that eye/face protection should be changed or removed when vision is impaired.[7, 12, 15, 20]

Comments
• Vision impairment may be due to visible soiling/contamination[12, 63] or damage,[15, 25, 63] for example, scratched or worn lenses, or a visibly deformed headband.[20] Two SIGN50 Level 4 expert opinion pieces, by Health New Zealand and the CDC, that provide recommendations on the changing or removal of eye/face protection worn for extended use, align with this.[10, 19] • One piece of SIGN50 Level 4 expert opinion by the Australian Government also provides recommendations on extended use and suggests removing eye/face protection when leaving a cohort area (a COVID-19 clinical area to a non-COVID-19 clinical area).[15] • There is consistency amongst four SIGN50 Level 4 guidance documents that state eye/face protection that is damaged should be discarded.[15, 19, 20, 25] • There is a lack of evidence regarding changing or removal of eye/face protection at the end of a clinical procedure or task.

8.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows: • UK (n=3)[12, 20, 25] • Australia (n=2)[15, 63] • USA (n=1)[19] • New Zealand (n=1)[10]

Comments
• Canada (n=1)[7] All guidance is specific to health and care settings, except the HSE guidance which is published to support the implementation of the PPER legislation, and therefore applies generally to PPE worn in any occupational setting. Two guidance documents are written for HCWs managing patients with COVID-19,[10, 15] one for patients with respiratory infections,[63] and one for people with acute respiratory infections, including COVID-19, within social care settings.[25]

8.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

8.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

8.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
GPP8.1 Eye/face protection should be changed or removed when vision is impaired due to visible soiling/contamination or damage.	Good Practice Point
GPP8.2 Eye/face protection should be changed or removed when a clinical procedure or task has been completed and/or there is no longer an exposure risk.	Good Practice Point
GPP8.3 Extended wearing of eye/face protection (worn for care of successive service users without removal between) should be changed or removed: • when contaminated by blood or body fluids (after individual service user contact, before contact with the next service user) • when vision is impaired due to visible soiling/contamination or damage	Good Practice Point

Recommendation	Grading
GPP8.4 Eye/face protection that is damaged should be discarded.	Good Practice Point

8.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
GPP8.1, GPP8.2 and GPP8.3 The change or removal of soiled eye/face protection when vision is impaired ensures surgical procedures or care activities are not hindered by a lack of visibility. GPP8.1, GPP8.2 and GPP8.3 The change or removal of eye/face protection prevents potential cross contamination events. GPP8.4 Discarding of damaged eye/face protection ensures this cannot be reworn, reducing the risk of transmission of potentially infectious agents.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
GPP8.1, GPP8.2, GPP8.3, and GPP8.4 No harms anticipated.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/ staff/ visitor perspective, the societal perspective, or both. Recommendations/ Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
GPP8.1, GPP8.2, GPP8.3, and GPP8.4 Only benefits identified.

8.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
GPP8.1, GPP8.2, and GPP8.3 No additional financial implications are expected as a result of changing or removing eye/face protection, however this will require sufficient stock. GPP8.4 Disposal of damaged eye/face protection will involve waste management processes which may have an environmental impact depending on the recommended method of disposal.

8.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
GPP8.1 and GPP8.3 ARHAI Scotland and its stakeholders support extant expert opinion guidance that eye/face protection should be changed or removed when vision is impaired,[7, 12, 15, 20] due to visible soiling/contamination[12, 63] or damage.[15, 25, 63] GPP8.2 There was no evidence included regarding the removal of eye/face protection after a clinical procedure or task. It is the expert opinion of ARHAI Scotland and its stakeholders that eye/face protection should be changed or removed following completion of a clinical procedure or task to reduce potential cross contamination events. GPP8.3 It is the expert opinion of ARHAI Scotland and its stakeholders that extended wearing of eye/face protection should be changed or removed when contaminated by blood or body fluids (after individual service user contact, before contact with the next service user) to reduce potential cross contamination events. GPP8.4 ARHAI Scotland and its stakeholders support extant guidance which recommends that damaged eye/face protection should be discarded.[15, 19, 20]

8.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

8.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/ religious reasons

Intentional vagueness
None.

8.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

8.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
None.

Research question 9: How should eye/face protection be disposed of?

Part A: Quality of evidence

9.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
Twelve pieces of evidence were included to inform this research question. Of these, two were identified in previous version(s) of this literature review,[12, 58] and 10 were identified during this update.[7, 10, 15, 19, 21, 23, 25, 63, 71, 73] One guideline by the WHO was graded AGREE: 'Recommend with modifications'.[21] Whilst this guideline is based on a systematic literature review, some aspects of the methods are not provided, such as the search strategy. Additionally, the link between recommendations and supporting evidence is unclear. The remaining evidence (n=11) consisted of guidance documents and were graded SIGN50 Level 4 expert opinion.[7, 10, 12, 15, 19, 23, 25, 58, 63, 71, 73] This type of evidence is potentially subject to bias as there is often a lack of supporting evidence and a lack of, or unclear, methodology for formulating the guidance. No primary evidence was identified for this research question.	11 x SIGN50 Level 4, expert opinion 1 x AGREE: Recommend with modifications

9.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
• There is consistency amongst four SIGN50 Level 4 expert opinion guidance documents that eye/face protection labelled single use must be discarded after use.[12, 15, 19, 25]   ○ The Australian government provide an example of face shields with foam bands and states these are considered single use due to their inability to be cleaned and disinfected.[15] • There is consistency amongst three SIGN50 Level 4 expert opinion guidance documents that recommend eye/face protection should be disposed of in a waste container,[7, 58, 63] Public Health Agency Canada specify this should be a no-touch receptacle.[7] • Additionally, four SIGN50 Level 4 expert opinion guidance documents state that eye/face protection should be considered as clinical waste, and therefore disposed of as such.[12, 23, 71, 73] • There is consistency between two SIGN50 Level 4 expert opinion documents that disposal of eye/face protection should be in accordance with local policy/procedures.[10, 12] • One SIGN50 Level 4 expert opinion guidance document by Health New Zealand provided COVID-19 guidance which states within the community setting, used PPE (including eye/face protection) should be disposed of in household general waste.[10] • One AGREE: 'Recommend with modifications' guideline by the WHO, and one SIGN50 Level 4 expert opinion guidance document by Public

Comments
Health Agency Canada recommend hand hygiene should be performed following disposal of eye/face protection.[7, 21]

9.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows: • UK (n=5)[12, 23, 25, 71, 73] • USA (n=2)[19, 58] • Australia (n=2)[15, 63] • New Zealand (n=1)[10] • Canada (n=1)[7] • International (n=1)[21] All evidence is directly applicable to health and care settings.

9.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

9.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

9.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
GPP9.1 Eye/face protection labelled single use should be disposed of after use.	Good Practice Point
GPP9.2 Eye/face protection should be disposed of within an appropriate waste receptacle.	Good Practice Point

Recommendation	Grading
Please refer to the Safe Disposal of Waste Literature Review to determine the 'appropriate' disposal route for eye/face protection.	
GPP9.3 Hand hygiene should be performed after disposing of eye/face protection.	Good Practice Point

9.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
GPP9.1 Disposing of single use eye/face protection after use ensures the equipment is being used effectively and in line with the manufacturer's instructions. GPP9.2 Disposing of eye/face protection as clinical waste may reduce occupational exposure risk from potentially infectious agents, reducing the risk of cross transmission and subsequent infection. GPP9.3 Performing hand hygiene after disposing of eye/face protection reduces the risk of cross contamination.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/ Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
GPP9.1, GPP9.2, and GPP9.3 None.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/ Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
GPP9.1, GPP9.2, and GPP9.3 Only benefits identified.

9.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context? Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
GPP9.1 Disposal of single-use eye/face protection will involve waste management processes and may have an environmental impact depending on the recommended disposal method(s).

9.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often

involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
GPP9.1 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection labelled single use should be disposed of after use.[12, 15, 19, 25] GPP9.2 ARHAI Scotland and its stakeholders support extant expert opinion that eye/face protection should be discarded in a waste container[7, 58, 63] as clinical waste.[12, 23, 71, 73] GPP9.3 This good practice point on performing hang hygiene after disposing of eye/face protection is informed by one ARI-specific WHO guideline graded AGREE: 'Recommend with modifications',[21] and one SIGN50 Level 4 expert opinion guidance document.[7] This evidence was considered insufficient for a recommendation due to the narrow scope of the WHO AGREE-graded guideline and the single SIGN50 Level 4 expert opinion, therefore a good practice point was developed.

9.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state "none". Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

9.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state "none". Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/religious reasons

Intentional vagueness
None.

9.12 Exceptions

List situations or circumstances in which the Recommendation/ Good Practice Point should not be applied.

Exceptions
None.

9.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
None.

Research question 10: How should reusable eye/face protection be reprocessed/decontaminated?

Part A: Quality of evidence

10.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
In total, 12 pieces of evidence were included to answer this research question. Of this evidence, two pieces were identified in previous version(s) of this literature review,[8, 11] and 10 were identified during this update.[2, 3, 7, 10, 15, 19-21, 25, 38] One piece of mandatory legislation was included, PPER.[38] One guideline by the WHO, graded AGREE: 'Recommend with modifications' was included.[21] Whilst this guideline is based on a systematic literature review, some aspects of the methods are not provided, such as the search strategy. Additionally, the link between recommendations and supporting evidence is unclear. Ten guidance documents graded SIGN50 Level 4 expert opinion, including one British Standard, were also included.[2, 3, 7, 10, 15, 19, 20, 25] Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is often a lack of supporting evidence/referencing	1 x Mandatory Legislation 1 x AGREE: Recommend with modifications 10 x SIGN50 Level 4, expert opinion

Comments	Evidence level
and a lack of, or unclear, methodology for formulating the guidance. No primary evidence was identified for this research question.	

10.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments
• There is consistency within the literature (one AGREE: 'Recommend with modifications' and 10 SIGN50 Level 4) that reusable eye/face protection should be cleaned and/or disinfected prior to re-use or storage.[3, 7, 8, 10, 11, 15, 19-21, 25] Only one guideline by the WHO, graded AGREE: 'Recommend with modifications' specifies eye/face protection be cleaned thoroughly before disinfection.[21] • Extant SIGN50 Level 4 guidance was consistent with the PPER legislation regarding how to clean/decontaminate eye/face protection: ○ The PPER legislates, "Every employer shall ensure that any personal protective equipment provided to their workers is maintained (including replaced or cleaned as appropriate) in an efficient state, in efficient working order and in good repair".[38] This is interpreted by HSE guidance, graded SIGN50 Level 4 expert opinion, published to support the implementation of PPER legislation which states there should be arrangements made for cleaning and disinfecting PPE used by more than one person.[20] Within this guidance it is stated that manufacturer's instructions on cleaning should be followed,

Comments
especially when using anti-mist, cleaning and antistatic fluids and cloths.[20] ○ One WHO AGREE: ‘Recommend with modifications’ guideline, and six SIGN50 Level 4 expert opinion guidance documents align with this, recommending cleaning/disinfection of eye/face protection should be carried out in accordance with manufacturer's instructions.[2, 3, 8, 10, 15, 19, 21] • One SIGN50 Level 4 expert opinion guidance documents, published by Health New Zealand, suggests cleaning can also be carried out in accordance with local IPC measures.[10] • One SIGN50 Level 4 expert opinion guidance document by Public Health Agency Canada states cleaning/disinfection should be carried out in accordance with organisational policy.[7] • British Standard 7028:1999 (SIGN50 Level 4) states cleaning should be carried out according to user instructions, but also provides specific cleaning guidance. This states that eye/face ‘protectors’ should be cleaned with a non-abrasive mild detergent, warm water, and a soft lint-free cloth, followed by rinsing and drying. Within the standard it is suggested that manufacturer’s cleaning solutions may be used, solvents or industrial cleaners should not be used, and general-purpose cleaning solutions should be used with ‘suspicion’.[11] What is meant by ‘suspicion’ in this context is not defined. • The WHO AGREE: ;Recommend with modifications’ guideline recommends hand hygiene be performed following cleaning of eye/face protection potentially contaminated with splash or spray.[21]

10.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows: • UK (n=5)[2, 11, 20, 25, 38] • USA (n=2)[8, 19] • Australia (n=2)[3, 15] • Canada (n=1)[7] • New Zealand (n=1)[10] • International (n=1)[21] Guidance published by the WHO (n=1) applies internationally.[21] This is applicable to a lesser extent to Scottish health and care settings, although more generalised and can therefore be adapted. The majority of the evidence (n=9) is directly applicable to health and care settings.[2, 3, 7, 8, 10, 19, 21, 25, 38] Three pieces of evidence which includes one piece of legislation, guidance to support this legislation and one British Standard apply directly to Scotland however, are more general to apply to a range of occupational settings and therefore may not directly apply within health and care settings.[11, 15, 20]

10.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

10.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

10.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
R10.1 Employers should ensure that cleaning and/or disinfecting arrangements are in place for reusable eye/face protection.	Recommendation
GPP10.1 Reusable eye/face protection should be cleaned and/or disinfected according to manufacturer's instructions, or in line with local policy or procedure.	Good Practice Point
GPP10.2 Reusable eye/face protection should be cleaned and/or disinfected before being re-used or stored.	Good Practice Point
GPP10.3 Hand hygiene should be performed after the cleaning and/or disinfecting of reusable eye/face protection.	Good Practice Point

10.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
R10.1 Ensuring cleaning and/or disinfecting arrangements are in place for reusable eye/face protection will allow for standardisation. GPP10.1 Following local policy, procedure, or manufacturer's instructions for cleaning and/or disinfection of eye/face protection ensures this is being carried out effectively whilst maintaining integrity of the eye/face protection.

Benefits
GPP10.2 Cleaning and/or disinfection of eye/face protection prior to re-use or storage prevents cross contamination and subsequent infection risk. GPP10.3 Performing hand hygiene after cleaning eye/face protection reduces the risk of cross contamination and subsequent infection.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
R10.1, GPP10.1, GPP10.2, and GPP10.3. No harms anticipated.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/ Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
R10.1, GPP10.1, GPP10.2, and GPP10.3 Only benefits identified.

10.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context?

Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
R10.1, GPP10.1, GPP10.2 Designated areas may be required to facilitate cleaning and/or disinfection of reusable eye/face protection. R10.1, GPP10.1, GPP10.2 and GPP10.3 There may be resource implications related to staff education and training in relation to cleaning and/or disinfection protocols. R10.1, GPP10.1 and GPP10.2 There may be financial implications whereby following manufacturer's instructions for cleaning and/or disinfection requires additional cleaning products. GPP10.1 Manufacturer's instructions may not align with them being used in a health and care setting context. Therefore, there may be resource implications to develop policy or procedure for decontamination processes.

10.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state "none". Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
R10.1 The PPER mandatory legislation and one piece of supporting SIGN50 level 4 expert opinion by the HSE underpins this recommendation.[20, 38] Therefore the evidence supporting this recommendation is sufficient. GPP10.1 This good practice point regarding cleaning and/or disinfecting eye/face protection according to manufacturer's instructions or in line with local policy or procedure is informed by one ARI-specific WHO guideline graded AGREE: 'Recommend with modifications',[21] and eight SIGN50 Level 4 expert opinion guidance documents.[2, 3, 7, 8, 10, 15, 19, 20] This evidence was considered insufficient for a recommendation due to the narrow scope of the WHO AGREE-graded guideline and limitations of SIGN50 Level 4 evidence, therefore a good practice point was developed.

Expert opinion
GPP10.2 This good practice point on cleaning and/or disinfecting reusable eye/face protection before reusing or storing is informed by one ARI-specific WHO guideline graded AGREE: 'Recommend with modifications',[21] and nine SIGN50 Level 4 expert opinion guidance documents.[3, 7, 8, 10, 11, 15, 19, 20, 25] This evidence was considered insufficient for a recommendation due to the narrow scope of the WHO AGREE-graded guideline and limitations of SIGN50 Level 4 evidence, therefore a good practice point was developed. GPP10.3 This good practice point on performing hand hygiene after the cleaning and/or disinfecting of reusable eye/face protection is informed by one ARI-specific WHO guideline graded AGREE: 'Recommend with modifications'.[21] This evidence was considered insufficient for a recommendation due to the narrow scope of the WHO AGREE-graded guideline, therefore a good practice point was developed.

10.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state "none". Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

10.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state "none". Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence

- legal considerations
- economic reasons
- ethical/ religious reasons

Intentional vagueness
None.

10.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

10.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
None.

Research question 11: How should eye/face protection be stored?

Part A: Quality of evidence

11.1 How reliable is the body of evidence?

(see SIGN 50, section 5.3.1, 5.3.4)

Comment here on the quantity of evidence available on this topic and its methodological quality. Please include citations and evidence levels. If there is insufficient evidence to answer the key question, go to section B.

Comments	Evidence level
Eight pieces of evidence were included to answer this research question, three pieces were identified in previous version(s) of this literature review,[8, 11, 36] and five pieces were identified during this update.[3, 20, 25, 38, 65] Of this evidence, two were mandatory legislation, PPER and COSHH.[36, 38] Six guidance documents were graded SIGN50 Level 4 expert opinion.[3, 8, 11, 20, 25, 65] Evidence graded SIGN50 Level 4 expert opinion is potentially subject to bias as there is a lack of supporting evidence an unclear, methodology for formulating the guidance.	2 x Mandatory Legislation 6 x SIGN50 Level 4, expert opinion

11.2 Is the evidence consistent in its conclusions?

(see SIGN 50, section 5.3.2)

Comment here on the degree of consistency demonstrated by the evidence. Where there are conflicting results, indicate how the group formed a judgement as to the overall direction of the evidence.

Comments

- The legislation PPER provides regulations that outlines employers' and employees' duties regarding PPE.[38] This legislates that, "Where an employer or self-employed person is required, by virtue of regulation 4, to ensure personal protective equipment is provided, they shall also ensure that appropriate accommodation is provided for that personal protective equipment when it is not being used."[38]
    - The HSE provide SIGN50 Level 4 expert opinion guidance which interprets this legislation to aid with compliance, this states PPE should be returned to the storage place provided under regulation 8 of PPER after use.[20] It is also stated that storage of PPE does not have to be in a fixed place and may be in suitable containers kept by the user, such as safety spectacles within a carrying case.[20]
- COSHH describes requirements to protect employees from substances hazardous to health within the workplace, including the use of PPE, and legislates, "Every employer shall ensure that personal protective equipment, including protective clothing is properly stored in a well-defined place".[36]
    - Within the HSE SIGN50 Level 4 expert opinion guidance, which provides interpretation of this legislation, it's stated that this accommodation should ensure safe storage of PPE when not in use. Specifically, to provide protection from contamination, loss, or damage, such as from sunlight, harmful substances, or damp.[65] The British Standard 7028:1999 directly aligns with this HSE guidance.[11] Three other SIGN50 Level 4 expert opinion documents published by the UK DHSC, the AST, and the NHMRC are consistent with these recommendations.[3, 8, 25]

11.3 Is the evidence applicable to Scottish health and care settings?

(see SIGN 50, section 5.3.3)

For example, do the studies include interventions, comparators or outcomes that are common to Scottish health and care settings?

Comments
The country or countries in which the guidance/research was conducted and/or applies to are as follows: • UK (n=6)[11, 20, 25, 36, 38, 65] • Australia (n=1)[3] • USA (n=1)[8] Only one piece of expert opinion published by the UK DHSC is directly applicable to the UK health and care settings.[25] The remaining evidence applicable to the UK is not specific to health and care settings however, is more generalised and therefore can apply. Evidence published in Australia and the USA applies to health and care settings.

11.4 Are the studies generalisable to the target population?

Comment here on sample size and methods of sample selection. Is the sample representative of the specific population/group of interest? Generalisability is only relevant to primary research studies.

Comments
Not applicable as no primary research studies were identified.

11.5 Are there concerns about publication bias?

(see SIGN 50, section 5.3.5)

Comment here on whether there is a risk in the evidence base that studies have been selectively published based on their results (and thus a risk that results from published studies are systematically different from unpublished evidence).

Comments
No primary evidence was identified for this research question therefore, risk of publication bias is not applicable.

Part B: Evidence to decision

11.6 Recommendations

What Recommendations or Good Practice Points are appropriate based on this evidence?

Note the following terminology:

- **"must"** implies that the health and care setting must implement the recommended approach and is used where a recommendation has been directly lifted from legislation or mandatory guidance
- **"should"** implies that the health and care setting "should" implement the recommended approach unless a clear and compelling rationale for an alternative approach is present
- **"should consider"** implies that the health and care setting should consider implementing the recommended approach

Recommendation	Grading
R11.1 When not being used, eye/face protection must be stored in a well-defined, safe storage place where it is protected from loss, contamination, and damage, such as from direct sunlight.	Recommendation

11.7 Balancing benefits and harms

Comment here on the potential impact of the Recommendation/Good Practice Point on service users, visitors and staff. Benefits and harms include considerations beyond IPC.

Benefits

List the favourable changes in outcome that would likely occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about pros.

Benefits
R11.1 Safe storage of eye/face protection prevents damage and loss of integrity and ensures the full protection being offered is provided.

Risks and harms

List the adverse events or other unfavourable outcomes that may occur if the Recommendation/Good Practice Point were followed correctly. Be explicit, clear about cons.

Risks and harms
R11.1 No harms anticipated.

Benefit-harm assessment

Classify as “benefit outweighs harm” (or vice versa) or a “balance of benefit and harm.” Description of this balance can be from the individual service user/staff/visitor perspective, the societal perspective, or both. Recommendations/Good Practice Points are possible when clear benefit is not offset by important harms, costs or adverse events (or vice versa).

Benefit-harm assessment
R11.1 Only benefits identified.

11.8 Feasibility

Is the Recommendation/Good Practice Point implementable in the Scottish context?

Describe (if applicable) financial implications, opportunity costs, material or human resource requirements, facility needs, sustainability issues, human factors etc., that may be associated with following a Recommendation/Good Practice Point. State clearly if information on feasibility is lacking.

Feasibility
R11.1 There will be a requirement for designated storage areas to facilitate the safe storage of eye/face protection.

11.9 Expert opinion

Summarise the expert opinion used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves expert opinion where evidence is insufficient. Clearly outlining that expert opinion helps users understand their influence on interpreting objective evidence. Expert opinion may also be required where there is no evidence available.

Expert opinion
R11.1 The evidence regarding storing of eye/face protection in a well-defined place is from legislation that is mandatory.[38] ARHAI Scotland and its stakeholders support extant expert opinion that storage of eye/face protection should be safe to protect from contamination, loss or damage, such as from direct sunlight, harmful substances, or damp.[3, 8, 11, 25, 65]

11.10 Value judgements

Summarise value judgements used in creating the Recommendation/Good Practice Point. If none were involved, state “none”. Translating evidence into action often involves value judgements, which include guiding principles, ethical considerations, or other beliefs and priorities. Clearly outlining value judgements helps users understand their influence on interpreting objective evidence.

Value judgements
None.

11.11 Intentional vagueness

State reasons for any intentional vagueness in the Recommendation/Good Practice Point. If none was intended, state “none”. Recommendations/Good Practice Points should be clear and specific, but if there is a decision to be vague, acknowledging the reasoning clearly promotes transparency. Reasons for vagueness may include:

- inadequate evidence
- inability to achieve consensus regarding evidence quality, anticipated benefits/harms, or interpretation of evidence
- legal considerations
- economic reasons
- ethical/religious reasons

Intentional vagueness
None.

11.12 Exceptions

List situations or circumstances in which the Recommendation/Good Practice Point should not be applied.

Exceptions
None.

11.13 Recommendations for research

List any aspects of the question that require further research.

Recommendations for research
None.

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Appendix 1 – Guidance documents

The considered judgement form and recommendation system are adapted from the following three guidance documents.

- Update to the Centers for Disease Control and Prevention and the Healthcare Infection Control Practices Advisory Committee Recommendation Categorization Scheme for Infection Control and Prevention Guideline Recommendations. (2019)
- Scottish Intercollegiate Guidelines Network (SIGN). A guideline developer's handbook. (2019)
- Grading of Recommendations, Assessment, Development and Evaluation (GRADE) Handbook. (2013)

Appendix 2 - Definitions

Term used	Description	Evidence
Recommendation	In general, 'Recommendations' should be supported by high- to moderate-quality evidence. In some circumstances, however, 'Recommendations' may be made based on lower quality evidence when high-quality evidence is impossible to obtain, and the anticipated benefits strongly outweigh the harms or when the Recommendation is required by Legislation or Mandatory Guidance.	Sufficient evidence (SIGN50 level 1++, 1+, 2++, 2+, 3, 4* AGREE Recommend AGREE Recommend (with Modifications)) Legislation, or mandatory guidance
Good Practice Point	Insufficient evidence or a lack of evidence to make a recommendation but identified best practice based on the clinical/technical experience (expert opinion) of the Working Group, with a clear balance between benefits and harms.	Insufficient evidence + Working Group expert opinion OR No evidence + Working Group expert opinion
No Recommendation	Both a lack of pertinent evidence and an unclear balance between benefits and harms.	No evidence

* A Recommendation cannot be developed when there is only SIGN50 level 4 evidence available.