ARHAI Scotland

Antimicrobial Resistance and Healthcare Associated Infection

NHS National Services Scotland

Standard Infection Control Precautions Literature Review

Personal Protective Equipment (PPE): Headwear

Version 3.0

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Key Information

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Document information

Description:	This literature review examines the available professional literature on PPE (Headwear) in the healthcare setting.
Purpose:	To inform the Standard Infection Control Precaution (SICP) section on PPE (Headwear) in the National Infection Prevention and Control Manual in order to facilitate the prevention and control of healthcare associated infections in all health and care settings in Scotland.
Target Audience:	All health and care staff involved in the prevention and control of infection in Scotland.
Update/review schedule:	Updated as new evidence emerges with changes made to recommendations as required. Review will be formally updated every 3 years with next review in 2024
Cross reference:	National Infection Prevention and Control Manual
Update level:	Practice – No significant change Research – Further research required in specific use of headwear as PPE, as well as the use of Surgical helmet systems.

Contact

ARHAI Scotland Infection Control team:

Telephone: 0141 300 1175

Email: nss.hpsinfectioncontrol@nhs.scot

Version History

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

Version	Date	Summary of changes
3.0	August 2021	**Why should headwear be worn for infection control purposes?** New question added for review. **Are there any legislative requirements for the use of headwear as PPE for infection control purposes?** New recommendation 'PPE should be CE marked (for products purchased prior to 01st January 2021 and in use till 31st December 2021) or UKCA marked (from 01st January 2021onwards) and comply with the Regulation 2016/425 and the Personal Protective Equipment (Enforcement) Regulations 2018 (updated 2021) **Why should headwear be worn for infection control purposes?** New recommendation: Appropriate headwear should be donned: 'In procedures where there is a risk of splash injury from blood and body fluids (specifically in situations of blood borne viruses and high consequence infectious diseases) as PPE to protect the user's hair and forehead from droplet contamination.' 'In surgeries where there is high risk of Surgical site infections, as source control, to prevent shed of micro-organisms into the surgical field.' **When/where should headwear be worn?** New recommendations: Theatre setting

Version	Date	Summary of changes
		‘Headwear should be worn as part of surgical attire when entering restricted or semi restricted areas of the surgery.’ ‘Headwear should be worn as PPE in procedures where splashing/spraying of body fluids is anticipated, this includes arthroplasties and renal surgeries.’ ‘Headwear should be worn as source control, when performing clean/aseptic procedures where risk of infection is deemed to be high.’ Non-theatre settings ‘Headwear is not deemed as a necessary component outwith the theatre setting, unless, in haemodialysis settings or when entering contaminant- free environments.’ **What type(s) of headwear should be used?** New recommendations: ‘The choice of headwear should consider containment of shed particles, comfort and fit.’ ‘The choice of headwear should be made, based on local policy, by the interdisciplinary team at the healthcare facility and may include headgear made up of a disposable or launderable re-useable, lint-free material which provides full hair and scalp coverage.’ **When should headwear be removed or changed?** This has been reworded to say ‘prior to leaving the dedicated clinical area (i.e the theatre setting); This has been reworded to say ‘at the end of a single clinical procedure/task; This has been reworded to say ‘at the end of a theatre session (for sessional use) This has been reworded to say ‘immediately or as soon as possible if visibly soiled / contaminated with blood or body fluids.’

Version	Date	Summary of changes
		How should headwear be removed/disposed of? New recommendation: 'Head cover should be removed from behind the head-taking care to refrain from touching the head' This has been reworded to say 'Disposable headwear should be disposed of as healthcare (including clinical) waste in appropriate waste receptacle/bin.' This has been reworded to say 'Reusable headwear (used for PPE or source control) should be processed through a healthcare accredited laundry facility.' New recommendation: 'The employer shall ensure that removed/disposed PPE is "subsequently decontaminated and cleaned (if reusable) or, if necessary, destroyed." **What considerations should be made regarding religious and/or cultural head/face wear?** This has been reworded to say: 'Head and/or face coverings worn for religious/cultural reasons must not impede patient care, nor compromise source control or impact on clinical practice. If PPE is required to protect against blood/body fluid exposure, religious/cultural head/face wear must not compromise the protective barrier. If worn, religious/cultural head/face wear should be clean and changed in accordance with uniform policy. All other items of PPE must comply with PPE attire for the respective task being performed.'
2.0	May 2016	**When/Where should headwear be worn**. This has been reworded to say 'The whole surgical team should wear appropriate headwear whilst in the theatre setting.' **How should headwear be removed/disposed of?** New recommendation

Version	Date	Summary of changes
		‘Reusable headwear should be processed through a healthcare accredited laundry facility.’
1.0	January 2012	Defined as final

Approvals

Version	Date Approved	Name
3.0	July 2021	National Policies Guidance and Outbreaks Steering Group
2.0	April 2016	National Policies and Outbreaks Steering Group
1.0	January 2012	Steering (Expert Advisory) Group for SICPs and TBPs

Contents:

1 Objectives

The aim of this review is to examine the extant professional literature regarding the use of headwear as Personal Protective Equipment (PPE) for standard infection control purposes in the clinical setting. The specific objectives of the review are to determine:

- Are there any legislative requirements for the use of headwear as PPE for infection control purposes?
- Why should headwear be worn for infection control purposes?
- When/where should headwear be worn?
- What type(s) of headwear should be used?
- When should headwear be removed or changed?
- How should headwear be removed/disposed of?
- How should headwear be stored?
- What considerations should be made regarding religious and/or cultural head/face wear?

N.B. The use of PPE as protection against either suspected or known specific infectious agents is considered as part of the Transmission Based Precautions (TBPs), and is therefore not within the scope of this review. Furthermore, this review did not assess the use of headwear in non-clinical settings where there may be a health and safety requirement for wearing specialist headwear, for example in either estates or kitchen environments.

2 Methodology

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

3 Discussion

3.1 Implications for practice

Are there any legislative requirements for the use of headwear as PPE for infection control purposes?

The wearing of PPE in the healthcare setting is covered by the Health and Safety at Work Act (1974)[1], Control of Substances Hazardous to Health (COSHH) Regulations (2002 as amended)[2] and the Personal Protective Equipment at Work Regulations (1992 as amended)[3]. However, there are no specific legislative requirements regarding the use of headwear as PPE for infection control purposes.

The Health and Safety at Work Act broadly covers the use of PPE, but is not healthcare specific[1]. COSHH regulations provide details in relation to hazardous materials and the use of PPE. They may be viewed as a detailed schedule of the Health and Safety at Work Act, including information on potential pathogens encountered in the healthcare environment and the use of appropriate PPE; for example, the use of gloves to protect against blood borne viruses during venepuncture. The Personal Protective Equipment at Work Regulations provide further general guidance on the use of PPE and relate to activities within the workplace which are not perceived to involve contact with hazardous materials. As an example, this could be the use of gloves to protect against glass fragments when cleaning up broken glass; however, if the glass contained a laboratory sample then the activity would be covered by COSHH regulations[2, 3].

All of the UK legislation and regulations outline the responsibilities of the employer and employee and also cover any unnecessary exposure to risk of service users, i.e. they cover NHSScotland, NHSScotland employees as well as NHSScotland patients. Both COSHH and the PPE at work regulations outline that if there is exposure to harmful substances, it should be eliminated/prevented in the workplace, but where avoidance of this is not reasonably practicable, a risk assessment should be performed and control measures employed which are appropriate to the activity[2, 3]

As outlined by legislation, PPE must be suitable for the task being undertaken, fit appropriately and, if being worn with other pieces of PPE, the pieces should be compatible with each other and in wearing them together, do not reduce the level of protection[3]. PPE should be CE marked

(for products purchased prior to 01st January 2021 and in use till 31st December 2021) or UKCA marked (for products purchased from 01st January 2021 onwards) and should comply with Regulation 2016/425 and the Personal Protective Equipment (Enforcement) Regulations 2018: Guidance 4[4, 5].

Employers must provide adequate instruction and information on how to correctly use and store PPE provided. This must be based on manufacturer's instructions, and employees in turn, have a responsibility to comply, by ensuring that suitable PPE is worn correctly for the task being carried out and is kept in good condition[3, 4]

Employers should make sure that PPE is checked at regular intervals and if found defective, be either replaced or repaired before further use[2].

Specific standards relating to headwear as PPE in the healthcare setting are outlined in **Appendix 1** of this document.

Why should headwear be worn for infection control purposes?

The rationale for the use of headwear for infection control purposes is twofold; as PPE, to protect the wearer from sources of infection e.g. splashing or spraying of blood (specifically from blood-borne viruses), and as source control to prevent shed of micro-organisms into the surgical field and hence protecting others from the wearer as a source of infection[6, 7]

There is extremely limited evidence in the area of specific use of headwear as PPE for infection control purposes, with most studies being experimental or expert opinion in nature. The majority of these studies involve surgical helmet suits. A German study identified that Surgical Helmet suits can efficiently reduce droplet contamination of the surgeon from blood splashes and bodily fluids, particularly in the forehead region as compared to conventional gowns/caps however this was significant only for hip arthroplasty procedures and not for knee arthroplasty. As the trials were neither blinded, nor randomized, the results could suffer from bias [8]. The authors of another experimental study conducted in New Zealand also recommend that Space suits/ Surgical helmet systems have a role as PPE in arthroplasty procedures, however it was not backed by scientific evidence [9]. One recommendation on use of Surgical helmet systems from USA, based largely on expert opinion, suggests that these systems should be used in renal surgeries conducted in high-risk patients with blood-borne viruses to protect the user from splash injury [7]. However, the use of Surgical helmet suits in NHS Scotland remains extremely limited.

Covering of hair, scalp and facial hair as a means of source control, has been recommended widely in literature [10] , to prevent shed of micro-organisms into the surgical field and to prevent contamination of contaminant-free environments such as clean rooms [11].This will be covered in more detail in the section on when/where should headwear be worn [6] and what type of headwear should be worn.

Two technical documents from the ECDC highlight the use of hair cover as part of PPE attire when assessing patients with High consequence infectious diseases [12, 13]. This is covered in more detail in the NIPCM Literature review of PPE for infectious diseases of high consequence.

When/where should headwear be worn?

The majority of evidence identified on this topic is specific to the surgical theatre settings. However, there is no clear consensus in the guidance relating to the use of headwear within this setting. While the Hospital Infection Society (HIS) Working Party on Infection Control in Operating Theatres considers that it is not necessary for non-scrubbed staff to wear headwear [14], the Association of Anaesthetists of Great Britain and Ireland (AAGBI), and the Association of Operating Room Nurses (AORN) advocate the use of headwear for all personnel in the surgical and wider perioperative settings[15] [10]. Six pieces of expert opinion were identified which recommend donning headwear as part of surgical attire when entering 'restricted or semi restricted areas' [6, 16-20].

There is clear consensus however, in the evidence regarding some procedures and the wearing of headwear by the whole theatre team, primarily for source control purposes to prevent occurrence of infections, these include arthroplasty, graft surgery and while performing clean, aseptic procedures where the risk of surgical site infection is deemed to be high [15, 21-24]. In addition, guidance from the Association for Professionals in Infection Control and Epidemiology (APIC) also advocate the use of caps as part of 'maximal sterile barrier precautions' within the haemodialysis setting [25] and the American Association of Nurse Anaesthetists recommend its use upon central venous catheter insertion in order to reduce incidence of central line-associated bloodstream infections [19].

Covering of head is also recommended as part of NHS England and NHS Improvement's Standard infection control precautions policy before entering contaminant-free environments such as clean rooms and decontamination units [26]. Public Health England also re-iterate this

point in Covid-19 related infection prevention recommendations where they recommend covering hair when entering clean rooms to prevent environmental contamination[11].

There was limited guidance with regards to non-theatre settings, the literature that was identified stated that head cover was not routinely required in clinical areas unless performing a sterile/aseptic procedure or as part of surgical attire in operating theatre [11, 27].

It is therefore recommended that all NHSScotland surgical staff wear appropriate headwear whilst in the theatre setting. In addition, headwear which is appropriate to the procedure being undertaken should always be worn by staff in other settings. Headwear is not deemed as a necessary component outwith the theatre setting unless performing sterile aseptic procedure or in a haemodialysis setting.

What type(s) of headwear should be used?

There is agreement in the identified evidence that headwear which completely covers the hair is recommended to minimise contamination during surgery (source control) [6, 23, 24 18, 26], with two pieces of expert opinion further stating the requirement of additional coverage of nape of neck , sideburns and facial hair[10, 19]. However, the evidence regarding full ear coverage is mixed, with some guidelines recommending full coverage of the ears [22] to prevent bacterial shed [28], whereas, more recent guidelines have stated that there is no scientific evidence to support this recommendation [17, 29].

Multiple studies looking at different types of headwear (e.g. disposable bouffant hats, cloth skull caps) in operative settings failed to identify any association between headwear type and the incidence of surgical site infections [30-32]. One experimental study found disposable bouffant hats to be more porous and permeable compared to cloth skull caps upon fabric analysis, however on active sampling there was no difference in microbial shed between the different hat types[33]. In light of this evidence, recent guidelines from AORN recommend that the choice of headwear should be left at the discretion of the members of the surgical team [17, 34], with due consideration being given to comfort, fit and particle shed [16]. In Anaesthesia care, use of both reusable cloth and single use caps is recommended [23]. A report from the working party group recommends wearing of disposable headgear by all scrubbed staff for prosthetic implant procedures [14]. NHS Greater Glasgow and Clyde's uniform policy 2014 also recommends usage of disposable /single-use caps in theatres [20].With regards to cloth caps, many expert opinions recommend freshly laundered lint-free/low-lint hats [6, 18, 23].

Headwear which completely covers the hair is recommended for use across theatre settings in NHSScotland.

When should headwear be removed or changed?

The majority of the evidence identified relates to surgical/operative settings, with very limited evidence from non-operative settings. A significant number of guidance documents/ expert opinions recommend removal of visibly soiled headwear immediately/ or as soon as possible after the procedure, and before leaving the respective clinical area[6, 16, 19, 24, 26, 34]. A recent document from AORN recommends changing of headwear at the end of the shift/ or when contaminated[17], while an older non-systematic review from AORN and the NHS Borders uniform policy from 2019 recommend that headwear should be changed daily / or when visibly contaminated[10, 35]. The American college of Surgeons however, state that if headwear has been worn during dirty or contaminated cases, then it should be removed prior to the subsequent case even if not visibly soiled[24].

A short report from AORN regarding headwear use during Covid-19 states that removal of head coverings should be performed immediately after contact with a case and then left at the respective facility for laundering (if re-usable) [34], whereas another document from Public Health England on remobilisation of services during Covid-19 stated that headwear should be changed between shifts or when visibly contaminated[11].

It is therefore recommended that NHSScotland theatre staff should change headwear at the end of a clinical procedure/task, or prior to this if contaminated with blood or bodily fluids. For theatre settings, headwear should be changed at the end of a theatre session and before leaving the theatre setting.

How should headwear be removed/disposed of?

Limited evidence was identified relating to appropriate removal and disposal of headwear. Following completion of a procedure, head cover should be removed from behind the head, after performing hand hygiene [36]. Care should be taken when removing surgical caps to refrain from touching the head. If wearing double gloves, the outer gloves should be removed following sterile glove protocol prior to headwear removal[19].

There is general consensus among literature that, ‘single use headwear’ should be disposed of as healthcare (including clinical) waste within an appropriate waste receptacle[6, 10]. Reusable headwear should be processed through a healthcare accredited laundry facility; home laundering is not recommended[10, 17, 18]. Whether items are accepted into healthcare accredited laundry facilities should be agreed upon at a local level through NHS Board laundry policies.

How should headwear be stored?

There was insufficient evidence to enable discussion regarding the storage of headwear in the healthcare setting, with only two pieces of PPE legislation identified[2, 3].

Headwear should be stored away from direct sunlight, heat sources and liquids, including chemicals, in an area that is clean and protects it from contamination. Clean headwear must be stored separately (or physically separated, i.e a separate compartment) from used or contaminated headwear. Legislation also states that re-usable PPE should be decontaminated and cleaned before storage to prevent cross contamination of the accommodation[3]. Clean PPE must be stored above floor level in enclosed carts, cabinets, or dispensing machines that are cleaned and disinfected regularly[17, 37].

What considerations should be made regarding religious and/or cultural head/face wear?

Insufficient evidence was identified in this review with regards to religious/cultural headwear in health and care settings. Patient safety comes first, taking cognisance of religious and cultural beliefs. Head and/or face coverings worn for religious/cultural reasons must not impede patient care or impact on clinical practice[24] and are not considered PPE. If PPE is required to protect against blood/body fluid exposure, religious/cultural head/face wear must not compromise the protective barrier, and personal protective headwear must be worn on top of religious/cultural headwear. If worn, religious/cultural head/face wear should be clean and changed in accordance with uniform policy[11]. Furthermore, remaining items of PPE must comply with PPE attire for the respective task being performed[3]

3.2 Implications for research

There was a paucity of data across the subject of headwear and so local NHS board policies have been cited throughout this review. Further research into the use of headwear as both personal protective equipment and source control is required.

The majority of identified evidence within the literature was specific to surgical theatre settings. The necessity for wider research would need to be balanced against the perceived risks associated with the wearing versus not wearing of headwear within various other clinical settings. In addition, specific evidence outlining the potential merits of different types of headwear as PPE would also be beneficial.

Several studies assessing the effectiveness of surgical exhaust helmets (as part of surgical space suits) and body exhaust gowns, for use within dedicated surgical settings, were also identified as part of this review[8, 38-41]. Overall, the results demonstrated that use of surgical helmets was associated with very limited or no increased benefit, in comparison to wearing a standard surgical gown and cap/no headwear[8, 9, 42, 43] whereas, Fraser et.al failed to identify any significant difference in contamination between the two types of headwear [39]. One study concluded that usage of some sort of headwear (SHS or CG and cap) was able to significantly reduce bacterial emissions at wound area as compared to no head cover, specifically in arthroplasty procedures[44], however, these were mock experiments with no standardisation and absence of blinding. A randomised controlled trial involving total knee arthroplasties also reached to a similar conclusion although it had multiple limitations in study design [45], including no follow-up with patients and only aerobic bacteria were assessed. One piece of expert opinion examined the usage of helmets as non-invasive ventilation interfaces to avoid aerosolisation when there are PPE shortages, however this recommendation is extremely specific to a pandemic scenario and may not be applicable under normal circumstances [46].It is anticipated that further literature will be published relating to the use of surgical helmets in certain surgical settings. Future literature review updates may need to consider the potential benefits and risks associated with the use of these.

Furthermore, there may be a need to clarify or expand legislation relating to the use of appropriate headwear as PPE in the healthcare setting. At present much of the legislation relates to the handling and management of dangerous substances and/or chemicals, and is generally not relevant to infection prevention within a clinical environment.

Recommendations

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

Are there any legislative requirements for the use of headwear as PPE for infection control purposes?

There is no direct legislative requirement to wear head protection for the purposes of the prevention and control of infection; however the Health and Safety at Work Act (1974), Control of Substances Hazardous to Health 2002 (as amended) Regulations and Personal Protective Equipment at Work Regulations 1992 (as amended) legislate that employers (i.e. NHSScotland) must provide PPE which affords adequate protection against the risks associated with the task being undertaken. Employees (i.e. healthcare workers) have a responsibility to comply by ensuring that suitable PPE is worn correctly for the task being carried out.

(Mandatory)

PPE should be CE marked (for products purchased prior to 1st January 2021 and in use till 31st December 2021) or UKCA marked (from 01st January 2021onwards) and comply with the Regulation 2016/425 and the Personal Protective Equipment (Enforcement) Regulations 2018 (updated 2021)

(Mandatory)

Specific standards relating to the quality and performance of headwear are outlined in Appendix 1.

Why should headwear be worn for infection control purposes?

Appropriate headwear should be donned:

In procedures where there is a risk of splash injury from blood and body fluids (specifically in situations of blood borne viruses and high consequence infectious diseases) as PPE to protect the user's hair and forehead from droplet contamination.

(Category C recommendation)

In surgeries where there is high risk of Surgical site infections, as source control, to prevent shed of micro-organisms into the surgical field.

(Category C recommendation)

When/where should headwear be worn?

Theatre setting

Headwear should be worn as part of surgical attire when entering restricted or semi restricted areas of the surgery

(Category C recommendation)

The whole surgical team should wear appropriate headwear whilst in the theatre setting.

(Category C recommendation)

Headwear which is appropriate to the procedure being undertaken should always be worn by theatre staff.

(Category C recommendation)

Headwear should be worn as PPE in procedures where splashing/spraying of body fluids is anticipated, this includes arthroplasties and renal surgeries

(Category C recommendation)

Headwear should be worn as source control, when performing clean/aseptic procedures where risk of infection is deemed to be high.

(Category C recommendation)

Non-theatre settings

Headwear is not deemed as a necessary component outwith the theatre setting, unless in haemodialysis settings or when entering contaminant- free environments.

(Category C recommendation)

What type(s) of headwear should be used?

Headwear for use in the theatre setting should completely cover the hair.

(Category C recommendation)

The choice of headwear should consider containment of shed particles, comfort and fit.

(Category C recommendation)

The choice of headwear should be made, based on local policy, by the interdisciplinary team at the healthcare facility and may include headgear made up of a disposable or launderable re-useable, lint-free material which provides full hair and scalp coverage.

(Category C recommendation)

When should headwear be removed or changed?

Headwear must be removed or changed:

- prior to leaving the dedicated clinical area (i.e the theatre setting);
- at the end of a single clinical procedure/task;
- at the end of a theatre session (for sessional use)
- immediately or as soon as possible if visibly soiled/contaminated with blood or body fluids;
- in accordance with manufacturer's instructions.

(Category C recommendation)

How should headwear be removed/disposed of?

Head cover should be removed from behind the head-taking care to refrain from touching the head.

(Category C recommendation)

Disposable headwear should be disposed of as healthcare (including clinical) waste in appropriate waste receptacle/bin.

(Category C recommendation)

Reusable headwear used for PPE or source control should be processed through a healthcare accredited laundry facility.

(Category C recommendation)

The employer shall ensure that removed/disposed PPE is “subsequently decontaminated and cleaned (if reusable) or, if necessary, destroyed.”

(Mandatory)

How should headwear be stored?

Headwear should be stored away from direct sunlight, heat sources and liquids, including chemicals, in an area that is clean and protects it from contamination.

(Mandatory)

What considerations should be made regarding religious and/or cultural head/face wear?

Head and/or face coverings worn for religious/cultural reasons must not impede patient care, nor compromise source control or impact on clinical practice. If PPE is required to protect against blood/body fluid exposure, religious/cultural head/face wear must not compromise the protective barrier. If worn, religious/cultural head/face wear should be clean and changed in

accordance with uniform policy. All other items of PPE must comply with PPE attire for the respective task being performed.

(Category C recommendation)

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Appendix 1: Specific standards relating to headwear as PPE in the healthcare setting

Standard	Title	Description	Publication date
BS EN 13921:2007	Personal protective equipment. Ergonomic principles.	This standard provides guidance on the generic ergonomic characteristics related to personal protective equipment (PPE) – it does not however cover the requirements which relate to specific hazards that PPE may be designed.	September 2007.
Statutory Instruments 2018 no. 390	Health and safety- Personal protective equipment (Enforcement) Regulations 2018	The purpose of this statutory instrument ("SI") is to provide for the enforcement of Regulation (EU) 2016/425 of the European Parliament and of the Council on PPE and repeals the older Directive 89/686/EEC.	March 2018

Legend:

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

Appendix 2 Grading of recommendations

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

Appendix 3: Search Strategy

EMBASE and MEDLINE search 2000 to current

1. Head Protective Devices/
2. head wear.mp.
3. headwear.mp.
4. headgear.mp.
5. head gear.mp.
6. hat?.mp.
7. 1 or 2 or 3 or 4 or 5 or 6
8. exp Infections/
9. exp Infection Control/
10. exp Disease Transmission, Infectious/
11. exp Hospitals/
12. 8 or 9 or 10 or 11
13. 7 and 12

Limit 13 to English language

CINAHL search 2000 to current

S14 S6 AND S13 (English language)

S13 S7 OR S8 OR S9 OR S10 OR S11 OR S12

S12 (MH "Cross Infection+")

S11 (MH "Religion and Religions+")

S10 (MH "Disease Transmission+")

S9 (MH "Infection Control+")

S8 (MH "Infection+")

S7 (MH "Hospitals+")

S6 S1 OR S2 OR S3 OR S4 OR S5

S5 "headwear”

S4 headgear

S3 head wear

S2 hat?

S1 (MH "Head Protective Devices")