

**Standard Infection Control Precautions Literature Review:  
Occupational exposure management  
(including sharps)**

**Version:** 3.0  
**Owner/Author:** Infection Control Team  
**Date of review:** Financial year 2019/20

## DOCUMENT CONTROL SHEET

Key Information:		
Title:	Standard Infection Control Precautions (SICPs) Literature Review: Occupational Exposure Management (including sharps)	
Date Published/Issued:	July 2016	
Date Effective From:	July 2016	
Version/Issue Number:	3.0	
Document Type:	Literature Review	
Document status:	Final	
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Version History:			
This literature review will be updated in real time if any significant changes are found in the professional literature or from national guidance/policy.			
Version	Date	Summary of changes	Changes marked
3.0	July 2016	<p><b>What occupational health screening and protection should be offered to healthcare workers?</b> Addition of new recommendation. 'In addition, healthcare workers directly involved in patient care should be up-to-date with their routine immunisations (e.g. tetanus, diphtheria, polio and MMR) and be offered immunisation against Tuberculosis (BCG vaccine), Influenza and Varicella zoster, as appropriate.'</p> <p><b>What is the recommended procedure for managing significant exposure incidents?</b> Addition of new recommendation. 'There is currently no PEP available for HCV. A number of antiviral agents are known to be effective against acute infection. Monitoring for acquisition of infection over the 6 month period following the incident is therefore recommended.'</p>	
2.0	June 2014	Updated after review of current literature	
1.0	January 2012	Final for publication	

**Approvals – this document requires the following approvals (in cases where signatures are required add an additional ‘Signatures’ column to this table)::**

Version	Date Approved	Name	Job Title	Division
3.0	July 2016	National Policies Guidance & Outbreaks Steering Group.		
2.0	June 2014	Steering (Expert Advisory) Group for SICPs and TBPs		
1.0	January 2012	Steering (Expert Advisory) Group for SICPs and TBPs		

<b>HPS ICT Document Information Grid</b>	
<b>Purpose:</b>	To inform the Standard Infection Control Precautions (SICP) section on occupational exposure management in the National Infection Prevention and Control Manual in order to facilitate the prevention and control of healthcare associated infections in NHSScotland healthcare settings.
<b>Description:</b>	This literature review examines the available professional literature on occupational exposure including sharps in the healthcare setting.
<b>Target audience:</b>	All NHS staff involved in the prevention and control of infection in NHSScotland.
<b>Circulation list:</b>	Infection Control Managers, Infection Prevention and Control Teams, Public Health Teams
<b>Update/review schedule:</b>	Updated as new evidence emerges with changes made to recommendations as required'.
<b>Cross reference:</b>	National Infection Prevention and Control Manual <a href="http://www.nipcm.hps.scot.nhs.uk/">http://www.nipcm.hps.scot.nhs.uk/</a>
<b>Update level:</b>	Change to practice – No significant change to practice  Research – No significant change to research

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**Contents:**

<b>1. Objectives.....</b>	<b>6</b>
<b>2. Methodology .....</b>	<b>6</b>
<b>3. Recommendations.....</b>	<b>7</b>
<b>4. Discussion.....</b>	<b>15</b>
4.1 Implications for practice.....	15
4.2 Implications for research .....	26
<b>4. References.....</b>	<b>27</b>

## 1. Objectives

The aim of this review is to examine the extant scientific literature regarding occupational exposure management (including sharps). The specific objectives of the review are to determine:

- What occupational health screening and protection should be offered to healthcare workers?
- What is the definition of a “significant occupational exposure”?
- What are defined as “sharps” in the healthcare setting?
- What is the risk to healthcare workers of blood borne virus (BBV) transmission following occupational exposure?
- What is the relevant legislation on occupational exposure management?
- What is the recommended procedure for managing significant exposure incidents?
- What safe systems of work should be in place to prevent sharps incidents?
- What is the definition of an “exposure prone procedure” (EPP) in the healthcare setting?
- What exclusions are there for healthcare workers with a known BBV undertaking EPPs?

Further recommendations relating to the disposal of sharps can be found within the [Safe Management of Waste SICP Literature reviews](#).

## 2. Methodology

This targeted literature review was produced using a defined methodology as described in the [National Infection Prevention and Control Manual: Development Process](#).

### 3. Recommendations

This review makes the following recommendations based on an assessment of the extant professional literature on occupational exposure management:

#### **What occupational health screening and protection should be offered to healthcare workers?**

Where risk assessment reveals that there is a risk to the health and safety of workers due to their exposure to biological agents for which effective vaccines exist, workers must be offered vaccination. Appropriate vaccination must be offered free of charge to all workers and students delivering healthcare and related activities at the workplace.

**(Mandatory requirement therefore no grade of recommendation can be made)**

All new healthcare workers, including students, who will have direct contact with patients and/or direct contact with patients' blood or blood-stained body fluids, should be **offered** immunisation against hepatitis B virus (HBV), with post immunisation testing of serological response. [Although healthcare workers should be encouraged to commence immunisation, there is no requirement for them to do so].

**(Mandatory requirement therefore no grade of recommendation can be made)**

All new healthcare workers, including students, who will have direct contact with patients, should be **offered** testing for hepatitis C virus (HCV) and human immunodeficiency virus (HIV). [Healthcare workers are not required to undertake such tests].

**(Mandatory requirement therefore no grade of recommendation can be made)**

All new healthcare workers, including students, who will perform exposure prone procedures (EPPs) are required to undergo additional health clearance checks before confirmation of an appointment to an EPP post. **The specific blood borne viruses (BBVs) that must be tested for are: HIV, HBV and HCV.**

**(Mandatory requirement therefore no grade of recommendation can be made)**

In addition, healthcare workers directly involved in patient care should be up-to-date with their routine immunisations (e.g. tetanus, diphtheria, polio and MMR) and be offered immunisation against Tuberculosis (BCG vaccine), Influenza and Varicella zoster, as appropriate.

**(Mandatory requirement therefore no grade of recommendation can be made)**

**What is the definition of a “significant occupational exposure”?**

A significant occupational exposure is a percutaneous or mucocutaneous exposure to blood or other body fluids from a source that is known, or found to be, positive for a BBV infection.

**What are defined as “sharps” in the healthcare setting?**

A medical “sharp” is an object or instrument necessary for the exercise of specific healthcare activities which is able to cut, prick or cause injury.

A “safer sharp” is a medical sharp that is designed and constructed to incorporate a feature or mechanism which prevents or minimises the risk of accidental injury from cutting or pricking the skin.

**What is the risk to healthcare workers of blood borne virus (BBV) transmission following occupational exposure?**

The estimated risk of transmission following a sharp injury (deep penetrating injury involving hollowbore needle or device visibly contaminated with blood) has been estimated at 1 in 3 for HBV; 1 in 30 for HCV; and 1 in 300 for HIV.

**What is the relevant legislation on occupational exposure management?**

The prevention and management of occupational exposures is broadly covered by UK health and safety at work legislation, specifically 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 Regulations (COSHH) 2002, and the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013. The European Council Directive 2010/32/EU (“the Sharps Directive”) and the Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (“the Sharps Regulations”) outline specific requirements in relation to sharps.

**(Mandatory requirement therefore no grade of recommendation can be made)**



### **What is the recommended procedure for managing significant exposure incidents?**

Employers must have procedures in place to ensure that they can respond effectively and in a timely manner when a sharps injury occurs.

**(Mandatory requirement therefore no grade of recommendation can be made)**

An employee who receives a sharps injury at work must notify their employer as soon as is practicable.

**(Mandatory requirement therefore no grade of recommendation can be made)**

Employers must have sufficiently robust arrangements in place to allow employees to notify them in a timely manner (including where the employee works out-of-hours or away from the employers' premises).

**(Mandatory requirement therefore no grade of recommendation can be made)**

When an employer is notified of a sharps injury, they must:

- record the incident;
- investigate the incident; and
- take any necessary action to prevent a recurrence.

**(Mandatory requirement therefore no grade of recommendation can be made)**

The employer must ensure that, when notified of any incident in which an employee has been injured by a sharp that has, or may have exposed them to a biological agent:

- The employee has immediate access to medical advice.
- The employee has been offered Post Exposure Prophylaxis (PEP) and any other medical treatment as advised by a registered medical practitioner; and
- The employer has considered whether counselling would be appropriate for the employee.

**(Mandatory requirement therefore no grade of recommendation can be made)**

## What is the recommended procedure for managing significant exposure incidents (continued)?

Significant occupational exposure incidents should be reported in accordance with Reporting of Injuries, Diseases and Dangerous Occurrences (RIDDOR) Regulations 2013.

**(Mandatory requirement therefore no grade of recommendation can be made)**

The following first aid actions should be taken immediately following any occupational exposure:

- The site of exposure should be washed liberally with soap and water, without scrubbing. Antiseptics and skin washes should not be used.
- Free bleeding of puncture wounds should be encouraged, but wounds should not be sucked.
- Exposed mucous membranes, including conjunctivae, should be irrigated copiously with water (before and after removing contact lenses, if applicable).

### **(Good Practice Point (GPP))**

Guidance on PEP for Hepatitis B outlined in the Department of Health “Green Book” should be followed in cases of occupational exposure to blood or body fluids potentially infected with HBV.

**(Mandatory requirement therefore no grade of recommendation can be made)**

There is currently no PEP available for HCV. A number of antiviral agents are known to be effective against acute infection. Monitoring for acquisition of infection over the 6 month period following the incident is therefore recommended

**(Mandatory requirement therefore no grade of recommendation can be made)**

In cases of significant occupational exposure to blood or body fluids potentially infected with HIV, PEP should be offered to the affected healthcare worker. PEP should be commenced as soon as possible after exposure, ideally within an hour (PEP is not generally recommended beyond 72 hours post-exposure).

**(Mandatory requirement therefore no grade of recommendation can be made)**

### What safe systems of work should be in place to prevent sharps incidents?

The use of medical sharps at work must be avoided so far as is reasonably practicable.

**(Mandatory requirement therefore no grade of recommendation can be made)**

When medical sharps are used at work, safer sharps must be used as far as is reasonably practicable.

**(Mandatory requirement therefore no grade of recommendation can be made)**

Needles should not be recapped unless an employer risk assessment has identified that recapping is required to control a risk, or risk of injury is effectively controlled by the use of a suitable tool, appliance or other equipment (such as a needle-block).

**(Mandatory requirement therefore no grade of recommendation can be made)**

Sharps should be disposed of in clearly marked and secure containers with written instructions for employees located close to areas where medical sharps are used.

**(Mandatory requirement therefore no grade of recommendation can be made)**

Used sharps should be immediately disposed of at the point of use by the user into a sharps disposal container conforming to current standards.

**(Mandatory requirement therefore no grade of recommendation can be made)**

Sharps disposal containers should be:

- Located in a safe position that avoids spillage.
- Located at a height that allows the safe disposal of sharps.
- Located out of the reach of children.
- Located away from public access areas.
- Secured to avoid spillage.
- Disposed of when the fill line is reached.
- Temporarily closed when not in use.
- Disposed of every 3 months, even if not full.

## What safe systems of work should be in place to prevent sharps incidents (continued)?

Sharps disposal containers should not be:

- Used for any purpose other than the safe disposal of sharps.

### **(AGREE rating: recommend)**

Employers must provide health and safety information and training for staff.

#### **Information provided to employees must cover:**

- The risks from injuries involving medical sharps.
- Relevant legal duties for employers and workers.
- Good practice in preventing injury.
- The benefits and drawbacks of vaccination.
- The support available to an injured person from their employer.

Employers must work with appointed safety representatives in developing and promoting the information given to workers.

#### **Training provided to employees must cover:**

- safe use and disposal of medical sharps;
- the correct use of safer sharps;
- what to do in the event of a sharps injury; and
- the employer's arrangements for health surveillance and other procedures.

Training should be provided in an appropriate form to ensure that employees know how to work safely and without risks associated with the specific sharps equipment they use.

**(Mandatory requirement therefore no grade of recommendation can be made)**

### What is the definition of an “Exposure Prone Procedure” in the healthcare setting?

An “Exposure Prone Procedure” (EPP) is defined as an invasive procedure where there is a risk that injury to the healthcare worker may result in the exposure of the patient’s open tissues to the blood of the worker (bleed-back). EPPs include procedures where the worker’s gloved hands may be in contact with sharp instruments, needle tips or sharp tissues (e.g. spicules of bone or teeth) inside a patient’s open body cavity (e.g. during open surgical procedures), wound (e.g. during deep suturing) or confined anatomical space (e.g. during root canal therapy) where the hands or fingertips may not be completely visible at all times.  
**(Mandatory requirement therefore no grade of recommendation can be made)**

### What exclusions are there for healthcare workers with a known BBV undertaking EPPs?

HIV infected healthcare workers must meet the following criteria before they can perform EPPs:

Either:

- a) be on effective combination antiretroviral therapy (cART), **and**
- b) have a plasma viral load <200 copies/ml

Or

- c) be an [elite controller](#)

And

- d) be subject to plasma viral load monitoring every three months **and**
- e) be under joint supervision of a consultant occupational physician and their treating physician, **and**
- f) be registered with the UKAP Occupational Health Monitoring Register (UKAP-OHR)

**(Mandatory requirement therefore no grade of recommendation can be made)**

Healthcare workers infected with HCV (HCV RNA positive) must not perform EPPs. This restriction does not apply to infected healthcare workers who respond successfully to antiviral therapy (i.e. HCV RNA negative 6 months after cessation of treatment).

**(Mandatory requirement therefore no grade of recommendation can be made)**

**What exclusions are there for healthcare workers undertaking EPPs (continued)?**

Healthcare workers infected with HBV who are Hepatitis B e antigen (HBeAg) negative and who have pre-treatment HBV DNA levels between  $10^3$  and  $10^5$  genome equivalents/ml may be allowed to perform EPPs if on antiviral therapy their viral load is suppressed to below  $10^3$  genome equivalents/ml.

Healthcare workers infected with HBV who have baseline viral loads above  $10^5$  genome equivalents/ml are restricted from performing EPPs while taking antiviral therapy.

Healthcare workers infected with HBV must not perform EPPs if their HBV DNA levels are greater than  $10^3$  genome equivalents while on or after treatment.

**(Mandatory requirement therefore no grade of recommendation can be made)**

## 4. Discussion

### 4.1 Implications for practice

#### **What occupational health screening and protection should be offered to healthcare workers?**

Guidance produced by the Scottish Government “Health Clearance for Tuberculosis, Hepatitis B, Hepatitis C and HIV”<sup>1</sup> and The Department of Health publication “Immunisation against infectious disease” (commonly known the Green Book)<sup>2</sup> describe pre-employment health checks for all staff considered to be at risk of exposure to pathogens. Staff members should be offered routine pre-exposure immunisation as appropriate. The EU Sharps Directive also states that where risk assessment reveals that there is a risk to the health and safety of workers due to their exposure to biological agents for which effective vaccines exist, workers should be offered vaccination.<sup>3</sup> Appropriate vaccination must be offered free of charge to all workers and students delivering healthcare and related activities at the workplace.<sup>3</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

Guidance produced by the Scottish Government specifically recommends that all new HCW, including students, who will have direct clinical contact with patients and/or patients’ blood or blood-stained body fluids, should be offered immunisation against hepatitis b virus (HBV), with post immunisation testing of serological response.<sup>1</sup> The guidance further states that although HCW should be encouraged to commence immunisation, there is no requirement for them to do so.<sup>1</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

Guidance produced by the Scottish Government also outlines a requirement that all new HCW, including students, who will have direct clinical contact with patients should be offered testing for hepatitis C virus (HCV) and human immunodeficiency virus (HIV). It is only a requirement that such tests are offered; HCW are not required to undertake such tests.<sup>1</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

Furthermore, guidance produced by the Scottish Government dictates that all new HCW, including students, who will perform exposure prone procedures (EPPs), require additional health clearance checks which must be completed before confirmation of an appointment to an

EPP post, as the HCW may be ineligible for appointment if found to be infectious.<sup>1</sup> The specific BBVs that must be tested for are: HIV, HBV; and HCV.<sup>1</sup>

UK guidance published by Public Health England on the management of HIV infected HCW who perform EPPs reiterates that all new HCWs employed or starting training who will carry out EPPs must be tested for HIV and that HCWs who decline testing should not be cleared for EPP work.<sup>4</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

In addition, it is recommended that staff directly involved in patient care should be up-to-date with their routine immunisations, e.g. tetanus, diphtheria, polio and MMR. Furthermore:

- BCG vaccination (against Tuberculosis) is recommended for HCW who may have close contact with infectious patients or if working with immunocompromised patient groups.
- Influenza vaccination is recommended on an annual basis.
- Varicella vaccination is recommended for susceptible healthcare workers who have direct patient contact. Those with a definite history of chickenpox (varicella zoster) or shingles (herpes zoster) will not require the vaccine.<sup>1:2</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

**What is the definition of a “significant occupational exposure”?**

Much of the information on occupational exposure management is derived from legislation and best practice recommendations. For the purpose of this literature review occupational exposures are defined as percutaneous exposures (where the skin has been broken by a needle/sharp, human scratch or bite) and a mucocutaneous exposures (where the mucous membranes (mouth, nose or eyes), or non-intact skin have been contaminated with blood or other bodily fluids). A “**significant occupational exposure**” is defined as a percutaneous or mucocutaneous exposure to blood or other body fluids from a source that is known, or found to be, positive for a BBV.<sup>5</sup>



## **What are defined as “sharps” in the healthcare setting?**

The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (“the Sharps Regulations”) <sup>6</sup> define the terms “medical sharp” and “safer sharp”. A medical sharp is defined as “an object or instrument necessary for the exercise of specific healthcare activities, which is able to cut, prick or cause injury”. A safer sharp is defined as “a medical sharp that is designed and constructed to incorporate a feature or mechanism which prevents or minimises the risk of accidental injury from cutting or pricking the skin”.

## **What is the risk to healthcare workers of blood borne virus transmission following occupational exposure?**

The main risks of infection from percutaneous or mucocutaneous exposures are from HBV, HCV and HIV.<sup>7</sup>

It should be noted that other infectious agents also have the potential to be transmitted through percutaneous/mucocutaneous exposures, but this is thought to occur extremely rarely in UK healthcare settings. These include, but are not limited to; human T lymphotropic retroviruses I & II (HTLV I & II), hepatitis D virus, cytomegalovirus (CMV), Epstein Barr Virus (EBV), Parvovirus B19, West Nile Virus (WNV) and malarial parasites.<sup>7</sup>

The estimated risk of transmission following a sharps injury (deep penetrating injury involving hollowbore needle or device visibly contaminated with blood) has been estimated at 1 in 3 for HBV, 1 in 30 for HCV and 1 in 300 for HIV.<sup>5;8</sup> The risk of infection following a mucocutaneous exposure is lower - estimated at 1 in 1000 for HIV, with no evidence of the risk of transmission for HBV or HCV following mucocutaneous exposure.<sup>5</sup> Based on 2004-2013 data from a UK based surveillance programme (Significant Occupational Exposures Surveillance System):<sup>9</sup>

- 4830 significant occupational exposures to BBV were reported among healthcare workers (HCW); the annual number of exposures increased from 373 in 2004 to 496 in 2013.
- Of HCW reporting a significant occupational exposure, half were exposed to HCV, a third to HIV and one in ten to HBV.
- No HBV or HIV seroconversions were reported.

- 9 HCV seroconversions were reported, with 7 achieving viral clearance following receipt of antiviral therapy.

The disparity between the original published estimates of risk and the observed risk within the UK is likely to be due to the success of various prevention strategies including immunisation and initiation of PEP, when indicated.<sup>9</sup>

It should be noted that under-reporting of significant occupational exposures may also impact on the reported low rate of transmission.<sup>9</sup> A recent report produced by the Health and Safety Executive supports this; indicating that assessed NHS organisations were found to lack consistency in the reporting of 'sharps' injuries to internal occupational health services and also on occasion also failed to report incidents meeting the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) criteria.<sup>10</sup>

Factors that may increase the risk of transmission and influence the management of the incident are:

- Percutaneous injury (rather than mucocutaneous).
- Injury from a device taken from a source patient's artery or vein.
- Blood exposure rather than exposure to blood-stained fluid, diluted blood (e.g. in local anaesthetic solution) or other body fluid.
- Injury from hollow bore rather than solid bore needle.
- Injury from wide gauge rather than narrow gauge needle.
- Deep rather than superficial injury.
- Visible blood on the device.
- No protective equipment used (e.g. gloves, double gloves, eye protection).
- First aid measures not implemented (e.g. washing, bleeding).
- HCV RNA detectable in source patient on most recent blood test.
- High viral load of HIV in source patient.
- Hepatitis B e antigen (HbeAg) detectable in source patient blood.
- Exposed person not or inadequately immunised against HBV.

- Source patient co-infected with more than one BBV.<sup>7</sup>

### **What is the relevant legislation on occupational exposure management?**

The prevention and management of occupational exposure is broadly covered by UK health and safety at work legislation, specifically the Health and Safety at Work etc. Act 1974<sup>11</sup>, the Management of Health and Safety at Work Regulations 1999<sup>12</sup>, the Control of Substances Hazardous to Health Regulations (COSHH) 2002<sup>13</sup>, and the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013.<sup>14</sup> In addition, the Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (“the Sharps Regulations”) came into force on 11<sup>th</sup> May 2013.<sup>6</sup> These Regulations implement aspects of the European Council Directive 2010/32/EU (“the Sharps Directive”) that are not specifically addressed in existing UK legislation.<sup>3;15</sup> The employer’s duties under the Sharps Regulations apply to healthcare employers (i.e. employers whose primary work activity is the management, organisation or provision of healthcare), and to healthcare contractors whose employees are at risk of injury from medical sharps, in relation to the provision of services to a healthcare employer.<sup>6;15</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

### **What is the recommended procedure for managing significant exposure incidents?**

The Sharps Regulations<sup>6</sup> require employers to take specific actions in the event of a sharps injury (outlined below). Employers must have procedures in place to ensure that they can respond effectively and in a timely manner when an injury occurs.<sup>6;15</sup>

#### **Notification of injuries:**

An employee who receives a sharps injury at work must notify their employer as soon as is practicable. Employers must ensure that they have sufficiently robust arrangements in place to allow employees to notify them in a timely manner, including where the employee works out-of-hours or away from the employer’s premises.<sup>6;15</sup>

#### **Recording and investigating incidents:**

When an employer is notified of a sharps injury, they must:

- record the incident;
- investigate the incident; and
- take any necessary action to prevent a recurrence.<sup>6</sup>

**Treatment and follow-up of a sharps injury:**

The employer must ensure that, when notified of any incident in which an employee has been injured by a sharp that has or may have exposed them to a biological agent (including BBVs):

- the employee has immediate access to medical advice;
- the employee has been offered PEP and any other medical treatment as advised by a registered medical practitioner; and
- the employer has considered whether counselling would be appropriate for the employee.<sup>6;15</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

In addition, the Reporting of Injuries, Diseases and Dangerous Occurrences (RIDDOR) Regulations 2013 place a statutory requirement on “responsible persons” to report deaths, injuries, diseases and dangerous occurrences that take place at work, or in connection with work.<sup>14</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

Guidance from the Department of Health on HIV PEP outlines the first aid actions to be taken immediately following any occupational exposure, whether or not the source is known to pose a risk of infection.<sup>16</sup> The guidelines make the following recommendations:

- The site of exposure (e.g. wound or non-intact skin) should be washed liberally with soap and water, but without scrubbing. Antiseptics and skin washes should not be used.
- Free bleeding of puncture wounds should be encouraged, but wounds should not be sucked.
- Exposed mucous membranes, including conjunctivae, should be irrigated copiously with water (before and after removing any contact lenses).<sup>16</sup>

**(Good Practice Point (GPP))**

The detailed guidance outlined in Chapters 12 and 18 of the Green Book should be followed in cases of occupational exposure to blood or body fluids potentially infected with HBV.<sup>2</sup> Briefly, following exposure to HBV, passive immunisation with hepatitis B immunoglobulin (HBIG) may be considered, in addition to active immunisation with hepatitis B vaccine.<sup>8</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

The Department of Health published guidance produced by the UK Chief Medical Officers' Expert Group on AIDS in relation to HIV PEP in 2008.<sup>16;17</sup> The guidance provides detailed advice on the actions to be taken in relation to PEP following occupational exposure to blood or body fluids potentially infected with HIV. Where an initial risk assessment indicates that a significant exposure has taken place (to blood or another high-risk body fluid from a patient or other source either known to be HIV infected, or considered to be at high risk of HIV infection, but where the result of a HIV test has not or cannot be obtained), it is recommended that PEP should be offered to the affected HCW.<sup>16;17</sup> PEP should be commenced as soon as possible after exposure, allowing for careful risk assessment, ideally within an hour. PEP is generally not recommended beyond 72 hours post-exposure and should be continued for 28 days.<sup>16;17</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

There is currently no PEP available for HCV.<sup>18</sup> A number of antiviral agents are known to be effective against acute infection. Monitoring for acquisition of infection over the 6 month period following the incident is therefore recommended.<sup>8</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

### **What safe systems of work should be in place to prevent sharps incidents?**

The Sharps Regulations build on existing HSE legislation, and contain four specific requirements intended to minimise the risks from the use of sharps.<sup>6;15</sup> The employer must ensure that:

- the use of medical sharps at work is avoided so far as is reasonably practicable;
- where medical sharps are used at work, safer sharps are used as far as is reasonably practicable (safety hazards or possible sources of blood exposure ('blood splatter') that use of the device may introduce, should be considered in all instances);
- needles are not recapped after use unless -

- an employer risk assessment has identified that recapping is required to control a risk (e.g. to reduce the risk of contamination of sterile preparations)
- the risk of injury is effectively controlled by the use of a suitable tool, appliance or other equipment (such as a needle-block).
- clearly marked and secure containers are located close to areas where medical sharps are used at work, with written instructions for employees for the safe disposal of medical sharps that are not designed for re-use.

**(Mandatory requirement therefore no grade of recommendation can be made)**

Used sharps should be immediately disposed of at the point of use by the user into a sharps disposal container conforming to current standards<sup>\* 19;20</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

Guidance produced by the National Institute for Health and Care Excellence and the EPIC3 guidelines for the prevention and control of healthcare associated infections make a number of recommendations in relation to the safe use and storage of sharps disposal containers.<sup>19;20</sup>

The key recommendations are that sharps disposal containers:

- Should not be used for any purpose other than the safe disposal of sharps.<sup>19</sup>
- Should be located in a safe position that avoids spillage.<sup>19</sup>
- Should be located at a height that allows for the safe disposal of sharps.<sup>19;20</sup>
- Should be located out of the reach of children.<sup>19;20</sup>
- Should be located away from public access areas.<sup>19</sup>
- Should be secured to avoid spillage.<sup>20</sup>
- Should not be filled above the fill line.<sup>19;20</sup>
- Should be disposed of when the fill line is reached.<sup>19;20</sup>
- Should be temporarily closed when not in use.<sup>19;20</sup>
- Should be disposed of every 3 months, even if not full.<sup>19</sup>

**(AGREE rating: recommend)**

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\* Current standards at the time of publication (July 2016) are UN3291 and BS EN ISO 23907:2012.

The Sharps Regulations 2013 supplement existing requirements for employers to provide health and safety information and training for staff.<sup>6;15</sup>

**Information provided to employees must cover:**

- the risks from injuries involving medical sharps;
- relevant legal duties of employers and workers;
- good practice in preventing injury;
- the benefits and drawbacks of vaccination; and
- the support available to an injured person from their employer.<sup>6;15</sup>

Employers must work with appointed safety representatives in developing and promoting the information given to workers.<sup>6;15</sup>

**Training provided to employees must cover:**

- the correct use of safer sharps;
- safe use and disposal of medical sharps;
- what to do in the event of a sharps injury; and
- the employer's arrangements for health surveillance and other procedures.<sup>6;15</sup>

Training should be in an appropriate form to ensure that employees know how to work safely and without risks to health with the specific sharps equipment they use.<sup>15</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

**What is the definition of an “exposure prone procedure” in the healthcare setting?**

An “exposure prone procedure” (EPP) is defined as an invasive procedure where there is a risk that injury to the HCW may result in the exposure of the patient's open tissues to the blood of the worker (bleed-back). These include procedures where the worker's gloved hands may be in contact with sharp instruments, needle tips or sharp tissues (e.g. spicules of bone or teeth) inside a patient's open body cavity (e.g. during open surgical procedures), wound (e.g. during deep suturing) or confined anatomical space (e.g. during root canal therapy) where the hands or fingertips may not be completely visible at all times.<sup>21;22</sup>

Procedures where the hands and fingertips of the worker are visible and outside the patient's body at all times, and internal examinations or procedures that do not involve possible injury to the worker's gloved hands from sharp instruments and/or tissues, are not considered exposure prone, provided routine infection control procedures are adhered to at all times.<sup>21</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

Procedures may be categorised by the anticipated level of risk from BBV transmission. As a brief summary, Category I procedures are considered to constitute a minimal risk of transmission and include history taking and/or physical examination, as well as minor surface suturing; Category II procedures are considered to constitute a possible but unlikely risk of transmission and include bronchoscopy and ophthalmic surgery; Category III procedures are considered to constitute a significant risk of transmission and are typically referred to as EPPs, as described with examples above.<sup>23</sup>

### **What exclusions are there for healthcare workers undertaking EPPs?**

HIV infected HCWs were previously restricted from carrying out EPPs.<sup>21</sup> However, in August 2013, the Scottish Government announced a change in policy to remove this restriction due to the 'extremely low risk of transmission from an infected HCW to a patient'.<sup>24</sup> In January 2014, Public Health England published guidance for the UK on the management of HIV infected HCWs who perform EPPs.<sup>4:24</sup> The policy and guidance state that HIV infected HCWs must meet the following criteria before they can perform EPPs:

Either:

- a) be on effective combination antiretroviral therapy (cART), **and**
- b) have a plasma viral load <200 copies/ml

Or

- c) be an elite controller<sup>†</sup>

And

- d) be subject to plasma viral load monitoring every three months **and**
- e) be under joint supervision of a consultant occupational physician and their treating physician, **and**

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<sup>†</sup> An elite controller is a person who is living with HIV who is not receiving antiretroviral therapy and who has maintained their viral load below the limits of assay detection for at least 12 months, based on at least three separate viral load measurements



f) be registered with the UKAP Occupational Health Monitoring Register (UKAP-OHR)<sup>4;24</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

The Scottish Executive Health Department issued guidance in 2002 on HCV infected HCWs.<sup>18</sup> In summary, the guidance recommends that HCWs who are known to have HCV (HCV RNA positive) should not perform EPPs.<sup>18</sup> HCV infected HCWs who respond successfully to antiviral therapy should be allowed to perform EPPs. A successful response to treatment is defined as the individual remaining HCV RNA negative 6 months after cessation of treatment.<sup>18</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

The Scottish Government Health Workforce Directorate issued guidance in 2009 on HBV infected HCWs and antiviral therapy.<sup>25</sup> In summary, the guidelines recommend that HBV infected HCW who are HBeAg negative and who have pre-treatment HBV DNA levels between  $10^3$  and  $10^5$  genome equivalents/ml may be allowed to perform EPPs if, on antiviral therapy, their viral load is suppressed to below  $10^3$  genome equivalents/ml.<sup>25</sup> HCWs with baseline viral loads above  $10^5$  genome equivalents/ml are ineligible to perform EPPs while taking antiviral therapy, on the grounds of patient safety.<sup>25</sup> The guidance further states that HCWs must not perform EPPs if their HBV DNA levels rise to greater than  $10^3$  genome equivalents/ml while on or after treatment.<sup>25</sup>

**(Mandatory requirement therefore no grade of recommendation can be made)**

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## 4.2 Implications for research

The prevention and management of occupational exposure incidents is subject to legislation and guidance. These are referenced in the discussion section of this review and govern the practicalities of prevention and management.

Of note, it is particularly important that new and existing safety devices and engineering controls are subject to efficacy, acceptability and cost effectiveness assessments.

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