Advisory Committee on Dangerous Pathogens Protection against blood-borne infections in the workplace: HIV and Hepatitis

Introduction to this guidance

Overview

1 People suffering from certain infections may have the agent of disease present in their blood. In some cases the organisms persist in the blood for long periods and in sufficient numbers to represent a high risk of transmission. If others are exposed to their blood - or other bodily fluids - the infectious agent may be transferred into their bodies and infect them.

2 The main risk of occupationally acquired blood borne infection relates to viruses that persist in the blood and are known to be endemic in the UK population. In these cases, the infectious agent is usually a blood-borne virus (BBV). The individual infected with the virus may not show symptoms or even be aware that they are carrying it.

Info Box 1.1: Bodily fluids that may contain BBVs

- Blood
- Cerebrospinal fluid
- Pleural fluid
- Breast milk
- Amniotic fluid
- Vaginal secretions
- Peritoneal fluid
- Pericardial fluid
- Synovial fluid
- Semen
- Other bodily fluids containing blood

Urine, faeces, saliva, sputum, tears, sweat and vomit, present a minimal risk of blood-borne virus infection unless they are contaminated with blood. However, they may be hazardous for other reasons.

3 BBVs of major concern are the human immunodeficiency virus (HIV, which causes Acquired Immune Deficiency Syndrome or AIDS), and Hepatitis B and C, which may result in chronic infection. These viruses represent a significant risk of blood-borne transmission. This guidance will therefore concentrate only on these viruses.

Purpose of the guidance

4 The aim of this guidance is to offer assistance to a wide readership, including those with responsibility for Health and Safety, as well as those in Occupational Health disciplines that need to assess the risks associated with exposure to such

viruses. It is intended to cover any workplace situation where exposure to blood-borne viruses (BBV) is possible. Controls that minimise risks during exposure-prone procedures, and recommended actions in the event of an exposure, are presented. In addition to providing information on a wide range of BBV related topics (see below), signpost information is also used throughout this guidance, in the form of hyperlinks and footnotes, to take the reader to other, often specialised documents produced by others.

5 This guidance is divided into four main parts:

Part 1: Background information **4**
This section provides background information on blood-borne viruses that are relevant to various UK occupational settings. This technical information may be particularly useful to those with an existing insight in to viral infection, but who may wish to learn more about the process of transmission and disease

Part 2: Health and safety law **18**
This section concerns relevant health and safety law and the legal duties of employers with respect to hazard and risk assessment. This includes consideration of emergency planning, staff training, control measures and health surveillance

Part 3: Control measures against blood-borne infections **32**
This section covers the practical process of risk assessment, and gives guidance on control measures that can mitigate the risk of infection in occupational situations. Other working environments are also considered, since exposure prone activities and professional care of BBV-infected individuals may take place outside of the clinical setting

Part 4: Guidance on management of incidents potentially involving exposure to a blood-borne virus **53**
This section provides guidance on what should be done in situations where a significant exposure to BBV has occurred. This section also offers fundamental information on risk assessment related to post exposure prophylaxis (PEP), with signposts to specialist information sources, as appropriate.

Appendices are also provided to cover certain areas in more detail. These include:

Appendix 1 - Use of gloves **59**
This appendix gives more detailed advice on the use of gloves as personal protective equipment and includes considerations relating to what gloves are appropriate to certain work activities and how to remove gloves safely in order to prevent cross-contamination

Appendix 2 – Transport of infectious substances **63**
This appendix provides an overview of the transport requirements for materials containing or contaminated with blood borne viruses

Appendix 3 – Sector-specific practical guidance **66**

This appendix provides an overview of Blood Borne Virus-related guidance relating to a variety of work place activities and relevant links to other specialist sites that serve specific work sectors

Appendix 4 – General contact details not previously mentioned in other sections **80**

Terminology

6 The term **blood-borne virus (BBV)** will be used in this guidance for brevity. Whenever this term is used, or blood is otherwise mentioned, it should be taken to include any high-risk body fluid (Info box 1.1) unless stated otherwise.

7 The BBV covered in this guidance are pathogens capable of causing severe disease and even death. Whilst medical treatments (i.e. post-exposure prophylaxis) may be available and effective, a common high standard of handling should be applied in all contact with blood, body fluids and tissues.

8 Other blood-borne infections exist that are not covered by this guidance. The control measures recommended are applicable to the majority of other infectious agents that may be found in blood at some time during the course of an illness.

Preparation of the guidance

9 The Advisory Committee on Dangerous Pathogens (ACDP) has prepared this guidance in consultation with HSE. ACDP advises the Health and Safety Executive, Health Protection Agency, Health and Agriculture Ministers and their counterparts under devolution in Scotland, Wales and Northern Ireland, as required, on all aspects of hazards and risks to workers and others from exposure to pathogens.

10 The guidance represents what is considered to be good practice by the members of the ACDP and has been agreed by the Health and Safety Commission and Health Ministers. Following this guidance is not compulsory and you are free to take other action, but it does contain information on legal requirements for certain activities and, if you do follow this guidance, you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

Part 1: Background information

The Blood-borne Viruses

11 Viruses of major concern are the human immunodeficiency virus (HIV, which causes Acquired Immune Deficiency Syndrome or AIDS), and the causative agents of causes of acute and chronic viral hepatitis. These viruses persist in the blood and are known to be endemic in the UK population. The individual infected with the virus may not show symptoms or even be aware that they are carrying it.

12 There are other causes of viral hepatitis. Hepatitis A and E are mainly spread by the faecal-oral route, do not result in chronic infection and hence do not present a significant risk of blood-borne infection. The Hepatitis D virus, previously known as the 'delta agent', is a defective virus, which can only infect and replicate in the presence of Hepatitis B virus.

13 This guidance will therefore concentrate only on HIV, hepatitis B and C viruses. These viruses are listed in Table 1 and are further described in the following sections.

Table 1: The Blood-borne Viruses

Abbreviation	Full name	Principal Disease
HIV 1	Human immunodeficiency virus - Type 1	AIDS
HIV 2	Human immunodeficiency virus - Type 2	AIDS
HBV	Hepatitis B virus	Hepatitis
HCV	Hepatitis C virus	Hepatitis

Notes:

1. All these viruses are in ACDP Hazard Group 3.

Human Immunodeficiency Viruses (HIV-1 and HIV-2)

14 There are two types of human immunodeficiency virus, HIV-1 and HIV-2. HIV-1 is responsible for the large majority of global HIV infections and cases of AIDS, whilst the relatively less common HIV-2 is mainly restricted to West Africa.

15 HIV-1 and HIV-2 are very similar in almost every respect, although accumulating evidence indicates that progression of disease is slower in HIV-2 infection. Unless specifically highlighted, the properties of these viruses are presented under the generic term 'HIV'.

Pathogenesis of HIV infection

16 HIV infects certain types of white blood cell, specifically helper T-lymphocytes, monocytes and some other cells that are key elements of the human immune

system. This usually results in the death of these cells. The hallmark of HIV infection is the gradual loss of helper T-lymphocytes from an infected person, ultimately leading to a state of generalised immunodeficiency and AIDS. In some cases, infection of the central nervous system occurs, often leading to progressive brain damage (encephalopathy).

17 Several different conditions may occur as a result of HIV infection that precede the development of AIDS. Most infected individuals generate antibodies to HIV within 3 months and, during this period, there may be a self-limiting illness resembling glandular fever (infectious mononucleosis). After a longer period, some develop a long-lasting generalised enlargement of the lymph glands. Other non-specific symptoms (including fever, night sweats and swollen lymph glands) are associated with progressive immune dysfunction and when AIDS develops fully, which often takes several years, it is characterised by the appearance of secondary opportunistic infections and tumours.

Transmission of HIV

18 Infectious virus is present at all stages of the illness. However, the viral load (measured by viral RNA in blood plasma) is proportional to the chances of the infected person transmitting the virus to a recipient. Viral loads are higher in the initial acute infection and towards the end of disease in an untreated person. It is usual for a person receiving anti–HIV therapy to have low – or even undetectable - viral loads, and be less likely to transmit virus. An approximate time course of HIV infection showing viral loads in relation to symptoms and antibody generation is shown in Figure 1.2.

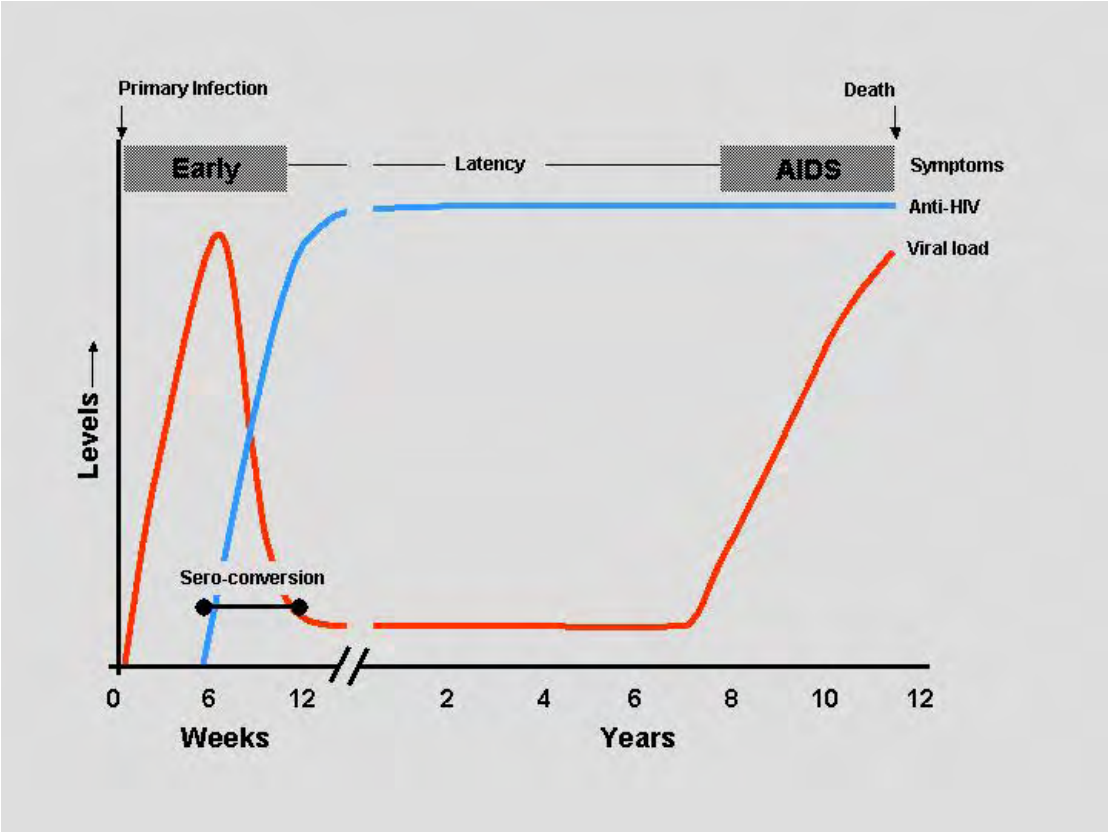


Figure 1.2: Approximate time course of HIV infection

19 Despite considerable genetic variation in HIV, there has been no discernible change in its routes of transmission. Available evidence indicates that by far the most important vehicles of infection are blood, semen and female genital tract secretions. Thus, worldwide, most infections have been transmitted sexually or by blood, the latter being principally via transfusion or from contaminated injecting equipment. Infection of babies from infected mothers has been attributed to transplacental infection, exposure during delivery or breast-feeding.

Prevalence of HIV and AIDS in the UK

20 Since the discovery of HIV in the 1980s, HIV/AIDS has grown from a small number of reports from North America of immunodeficiency syndrome amongst men who have sex with men (MSM) to a global pandemic. Initially, MSM were the most affected group, but more recently the UK HIV epidemic has shown a rapid increase in the number of diagnoses among heterosexuals and a steady increase in the number of diagnoses in MSM. There continues to be a constant small number of new diagnoses among intravenous drug users, children born to HIV-infected women and blood/blood product recipients. The increase in diagnoses of heterosexually acquired infections has been greater among women than men.

21 In 2005 there were an estimated 63,500 diagnosed and undiagnosed people aged between 15 and 59 living in the UK with HIV. This equates to around 0.1% of the population. Geographically, in the UK, London remains the focus of the epidemic, with higher infection rates relative to the rest of the UK. The number of people living with diagnosed HIV is rising each year due to increased numbers of new diagnoses and improved survival due to anti-retroviral therapies.

Info Box 1.2: HIV and other Sexually Transmitted Infections in the UK

"A Complex Picture" is a report on HIV and STIs in the UK and is published by the Health Protection Agency and its collaborators. A full copy of the report can be downloaded at:
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1196942145471?p=1158945066450

For further information on HIV prevalence and epidemiology, please visit:

Health Protection Agency HIV and AIDS webpages:
http://www.hpa.org.uk/web/HPAweb&Page&HPAwebAutoListName/Page/1200660065903

Centers for Disease Control and Prevention HIV/AIDS webpages*:*
http://www.cdc.gov/hiv/topics/basic/index.htm

Hepatitis B virus (HBV)

22 Whilst HBV infection is endemic in the United Kingdom, it is more common in developing countries where children often acquire infection from mothers during birth or through close contact in early infancy. The United Kingdom is a low

prevalence area, with a carriage rate of 0.1-0.5%, although actual rates may vary between individual communities.

Pathogenesis of HBV infection

23 Once inside the host, HBV is transported in the blood to the liver where it infects liver cells. The incubation period of acute HBV infection is about 75 days but it ranges from 45 to 200 days. The virus spreads efficiently in the liver and causes a spectrum of disease, ranging from acute hepatitis to more chronic liver disease and liver tumours. A small proportion of patients with acute infection suffer liver failure, although most recover from the infection. Asymptomatic infection and illness without jaundice does occur, particularly in children and the immunocompromised. The likelihood of a patient developing chronic infection is inversely related to age at the time of infection. Chronic infection occurs in at least 90% of infected neonates, 25% of children aged 1-5 years and 5% or less of adults.

24 HBV is an unusual virus as large quantities of viral proteins are produced, resulting in the production of a range of different particles, some of which are infectious and some of which are not. Viral protein is secreted into the blood and its presence can be a useful marker of infection. In individuals chronically infected with HBV, the persistence in the circulation of viral proteins indicates continuing high potential infectivity for sexual partners and for babies born to carrier mothers. These chronically infected individuals, who may be totally without symptoms, also present a major risk to non-immune health care workers and others accidentally exposed by, for instance, a needle-stick injury. In addition, the continued presence of viral proteins is associated with progressive liver damage (chronic active hepatitis and cirrhosis) and increased risk of primary liver cancer. Much of the damage to the liver in chronic cases is believed to be as a result of immune responses to the infection.

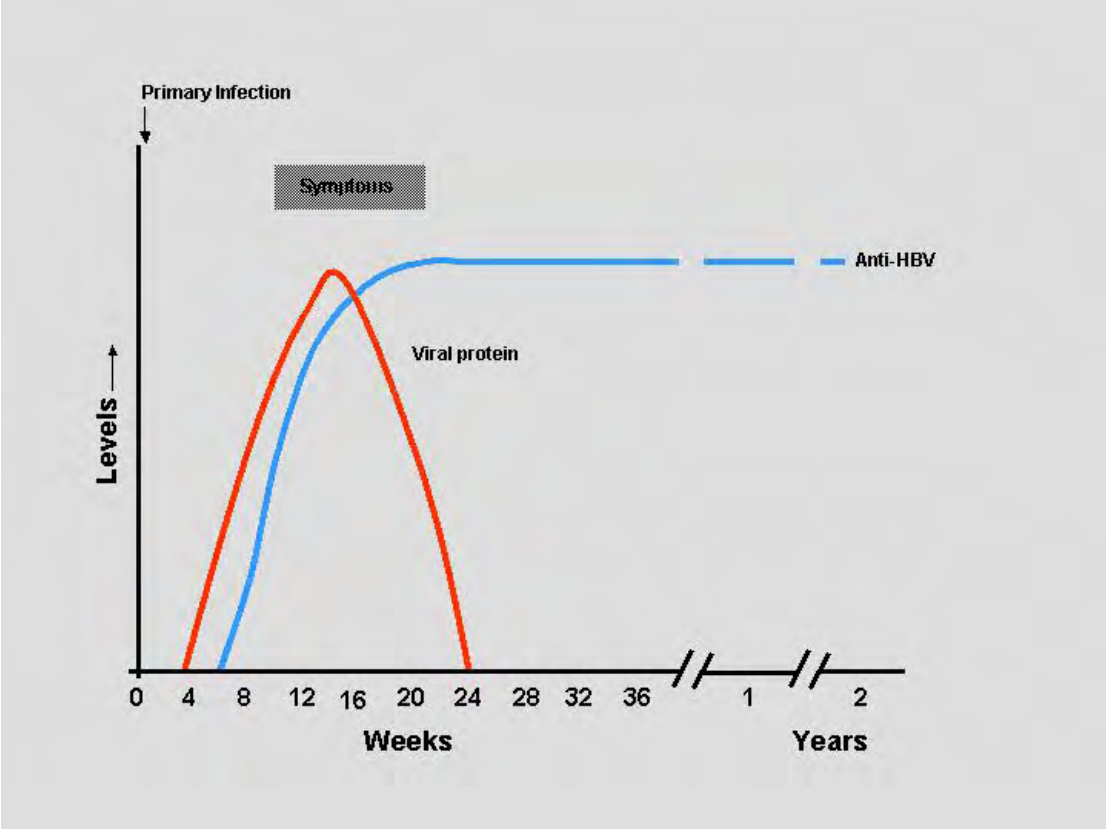


Figure 1.4: Approximate time course of acute Hepatitis B Virus Infection with Recovery

25 The severity of illness is clearly influenced by host immune responses to the virus. Anti-HBV antibodies are induced by infection, and the specificity and type of these antibodies relative to levels of viral proteins is often indicative of the seriousness and nature of disease. Typical relationships between viral proteins, antibody generation and the progression of disease are illustrated in Figure 1.4 for acute HBV infection and in Figure 1.5 for chronic HBV infection.

Transmission of HBV

26 In Western Europe, North America and other developed countries, infection occurs sporadically by sexual contact and blood transfer, particularly by the sharing of needles and syringes in drug misuse. In England and Wales, injecting drug use was the most frequently reported route of infection. Transmission to babies from infected mothers has been largely attributed to exposure during or after delivery, with transplacental infection being apparently rare. Vertical transmission from mother to baby can be prevented by the administration of HBV immunoglobulin and vaccinating the newborn in cases where the mother is infected with the virus.

27 Occupational exposure in the healthcare setting usually occurs as a result of a needle-stick injury, injury with other contaminated sharp instruments, or as a result of contamination of the mucous membranes (eyes, nose and mouth). Occupational acquisition of HBV has been significantly reduced due to the availability of an effective vaccine for the virus.

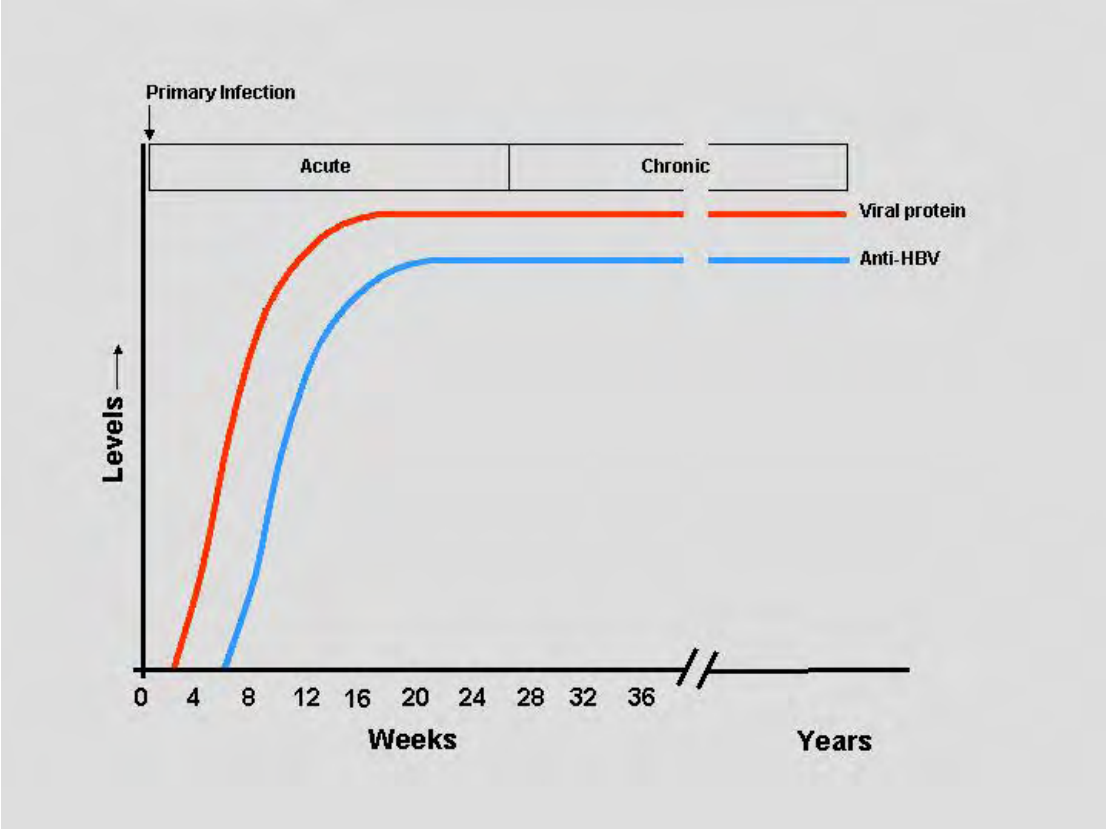


Figure 1.5: Progression to Chronic Hepatitis B Virus Infection

Prevalence of HBV in the UK

28 The UK falls into the lowest category of prevalence for HBV, as determined by the World Health Organisation. The prevalence rate is believed to be between 0.1% and 0.5% of the UK population. HBV infections are usually acquired in adulthood, principally resulting from sexual activity or injecting drug use. Reports of acute HBV infection have fallen sharply, which is thought to be mainly due to a decline in cases in injecting drug use and possibly risk behaviour modification in response to the HIV/AIDS epidemic. However, the frequency of chronic infection is increasing because of migration from high prevalence areas of the world.

Info Box 1.3: Further information on Hepatitis B virus

For further information on Hepatitis B prevalence and epidemiology, please visit:

Health Protection Agency Hepatitis B webpages:
http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1191942171112?p=1191942171112

Centers for Disease Control National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention Viral Hepatitis B webpages
http://www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm

Hepatitis C virus

29 Post-transfusion infectious hepatitis caused by agents other than HBV has long been recognised. These cases at one time were collectively termed 'non-A non-B hepatitis' and the main cause is now known to be the hepatitis C virus (HCV). HCV has a worldwide prevalence, although actual rates of infection vary depending on socio-economic factors, such as intravenous drug use and medical practices, as the virus is primarily transmitted via direct introduction of the virus into the blood. It is estimated that 0.5-1 % of the UK population has a chronic HCV infection.

Pathogenesis of HCV infection

30 Once inside the host, HCV is transported in the blood to the liver where it infects liver cells, although other types of cell, including blood cells, may also be infected. The incubation period for HCV ranges from 2 to 26 weeks. The acute phase of HCV infection is often asymptomatic or mild and can resolve in 2 to 12 weeks. Diagnosis of infection is by detection of antibodies or virus RNA in serum. If the infection proceeds to a chronic phase, progression of liver damage is usually slow and the most common complaint is fatigue. Liver enzyme abnormalities may fluctuate or persist and the degree of liver damage is variable. At least 55% of patients with acute HCV infection go on to develop chronic infection with a variable degree of hepatitis with the risk of cirrhosis and, in a smaller number, primary liver cancer several decades later. Typical relationships between detectable virus, antibody generation and the progression of disease are illustrated in Figure 1.6 for acute HCV infection and in Figure 1.7 for chronic HCV infection.

Transmission of HCV

31 Routine screening of blood donors has been introduced to prevent transmission via transfusion and the use of blood products. The greatest risk of acquiring HCV in the UK is now through sharing of blood-contaminated needles and injecting equipment among drug users. Occupational exposure in the healthcare setting usually occurs as a result of a needle-stick or injury with other contaminated sharp instruments. Exposure to other contaminated sharp injuries, for instance via tattooing and skin piercing may also result in infection. Mother-to-baby transmission occurs at a rate of about 3-5% (up to 15% in mothers who are also infected with HIV). Transmission via sexual intercourse is unusual, except in individuals who are also infected with HIV. Amongst Asian-, African- and Eastern European-born Britons, infection has often been acquired through exposure to medical procedures with non-sterilised equipment outside the UK.

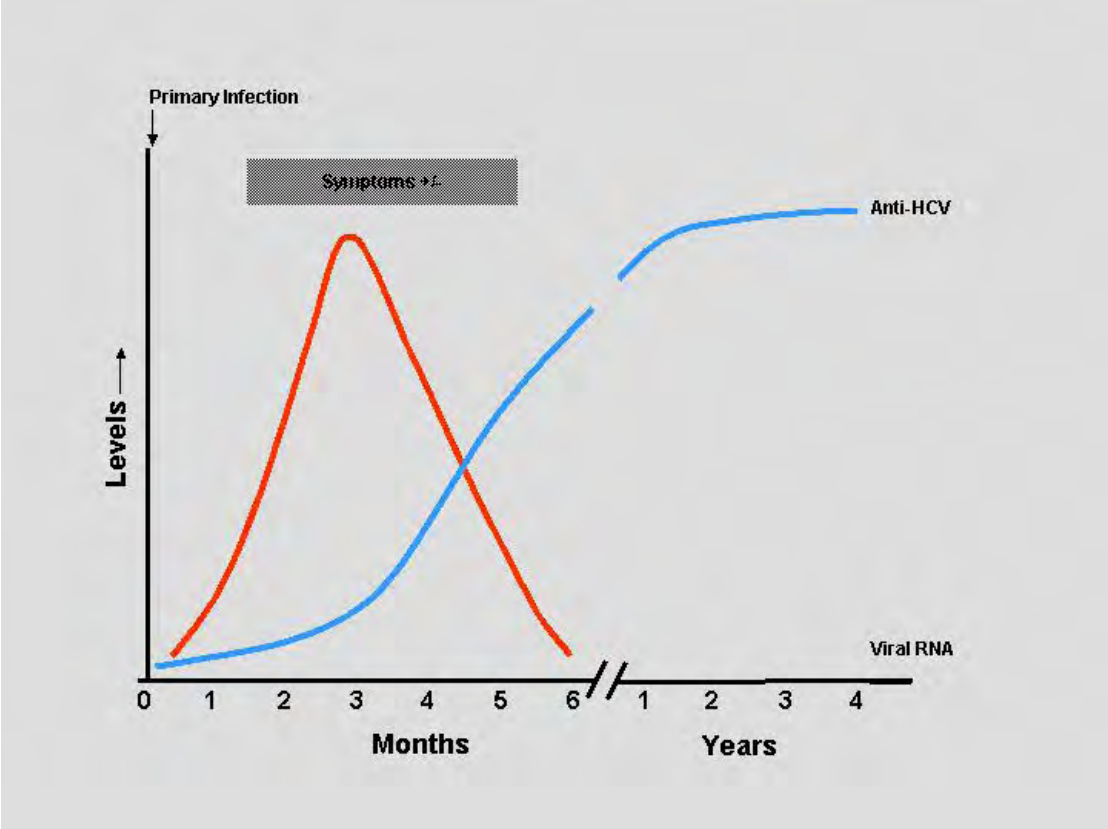


Figure 1.6: Approximate time course of acute HCV infection with Recovery

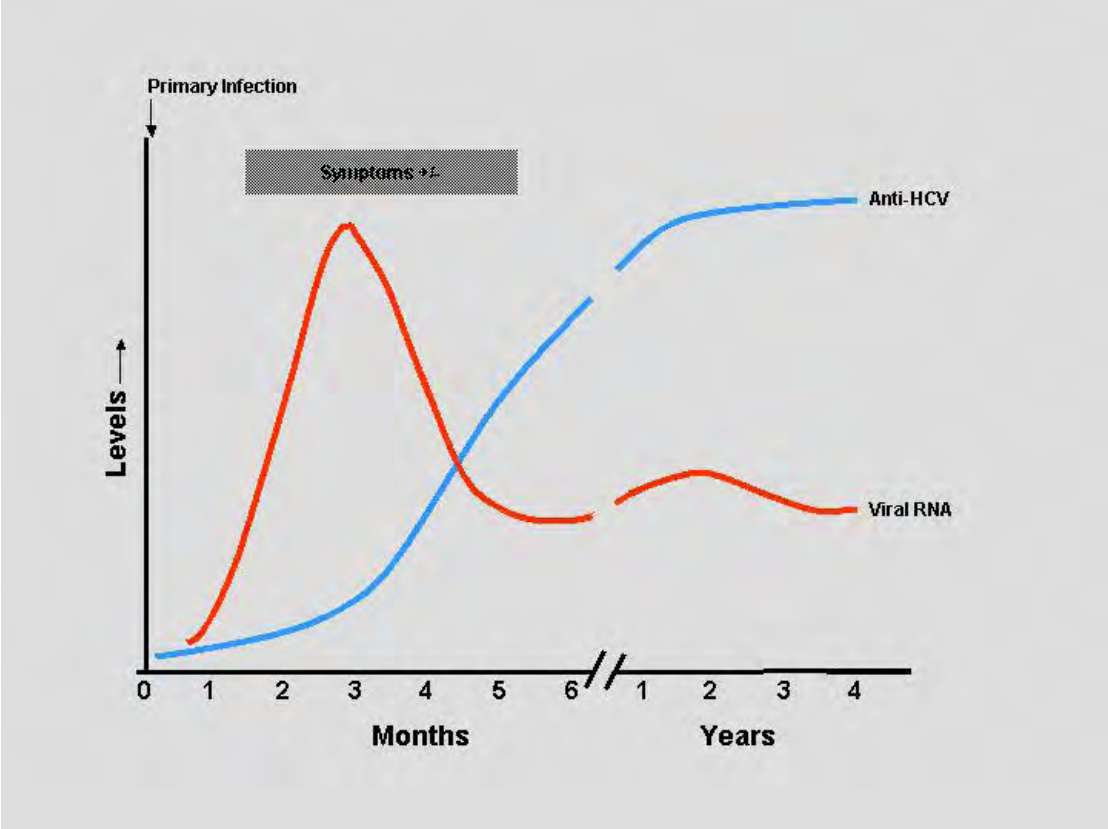


Figure 1.7: Progression to Chronic HCV infection

Prevalence of HCV in the UK

32 HCV infection is a major worldwide public health problem, although the UK is thought to be a low prevalence area. Based on seroprevalent studies performed on residual specimens, the prevalence of HCV in England is predicted to be around 0.5-1%. As with HIV infection, the prevalence of HCV is higher in London compared to other UK regions.

33 Most infections are due to injecting drug use. Since the discovery of HIV, there has been raised awareness of transmission of blood-borne viruses through shared injecting equipment. Those who report injecting crack-cocaine have a much higher prevalence of HCV than those who do not. However, a significant number of chronic infections may have been acquired in the 1970s and 1980s through contaminated blood products, before routine screening was introduced.

34 Approximately 80% of acute infections are asymptomatic and 55-85% of all HCV infections become chronic. Therefore, it is likely that many infected individuals are unaware of their status. Some patients infected with HCV may also be infected with HIV or HBV.

35 Hepatitis C can now be treated and around 55% of those individuals are cured. Nevertheless, as HCV infection is not always symptomatic it is important that those at risk volunteer to be confidentially tested in order to benefit from such treatment. All blood donations are now tested for HCV. Again, the prevalence of HCV infection is likely to be higher in some areas and in some population groups than in others.

Info Box 1.4: For further information on Hepatitis C prevalence and epidemiology, please visit:

Health Protection Agency Hepatitis C webpages:
http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1191942171144?p=1191942171144

Centers for Disease Control National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention Viral Hepatitis C webpages
http://www.cdc.gov/ncidod/diseases/hepatitis/c/index.htm

How Blood-borne Viruses are Spread

Routes of transmission

36 BBVs are transmitted through entry of blood or other body fluids containing virus into the body of a susceptible person. The efficiencies of transmission of HIV, HBV and HCV differ by each of the routes listed:

- sexual intercourse (common for HBV, HIV; inefficient for HCV)
- sharing injecting equipment

- skin puncture by blood-contaminated sharp objects (e.g. needles, instruments or glass)
- childbirth (i.e. the mother infects the child either before or during birth or through breast-feeding - very common for HBV; 20% for HIV; 3% for HCV) although the risks for HBV and HIV can be dramatically reduced by appropriate intervention

37 Less common means of transmission are:

- contamination of open wounds (e.g. blood injuries during sporting activities)
- contamination of skin lesions (e.g. eczema)
- splashing of the mucous membranes of the eye, nose or mouth;
- human bites when blood is drawn; this may be more of a problem in certain occupations, e.g. prison and police service, where front line workers may be exposed to violent behaviour.

38 There is a risk of acquiring a BBV infection via blood transfusion. However, in the United Kingdom all blood donations are screened for HBV, HCV and HIV and the risk is, therefore, remote. There is no evidence that BBV infections are transmitted by everyday social contact, such as shaking hands with an infected person, sharing utensils or via coughs and sneezes. It is not thought that BBV can be transmitted via the respiratory route, although this possibility cannot be dismissed entirely when, under laboratory conditions, virus is present in concentrations far exceeding that found in normal bodily fluids.

Occupational transmission

39 Accidents with blood-contaminated needles in health care work are probably the most common mode of occupational transmission of BBV. BBV transmission to both patients and workers has been documented in association with clinical procedures. Unless precautions are taken, BBV may be transmitted to workers or to patients/clients in the course of invasive procedures.

40 It is important that decontamination practices are adequate and are applied scrupulously. Any procedure in which there is a risk of blood transfer (e.g. surgery, dentistry, venepuncture, acupuncture, body-piercing, tattooing), will require:

i. Care to avoid exposure of the operator

ii. Adequate decontamination of reusable equipment

iii. Safe disposal of single-use equipment

41 Sector specific guidance on preventing occupational exposure to BBV is provided in the annexes. This includes:

- Guidance on the protection of health care workers from infection with HIV and hepatitis viruses in clinical practice
- Guidance for health care workers infected with HIV, HBV, or HCV
- Infection control for Dental Practitioners

- Guidance on 'skin-piercing' (i.e. acupuncture, body-piercing, tattooing, beauty treatments etc)
- Guidance for the Emergency Services
- Guidance for dealing with injuries in professional sport

BBV infection associated with work

Risk of transmission of blood borne viruses – Healthcare workers

42 The overall risk of any of the blood borne viruses being transmitted by an infected patient to a health care worker and from an infected health care worker to a patient has been estimated as shown in Table 2. The corresponding risk of transmission for each virus shows that HBV is the most easily transmitted virus and HIV the least. Health care workers are at greater risk of infection from patients than vice versa. The UK rates of transmission may appear to be higher than in other countries. This is probably an artefact of the more active approach to surveillance and the identification of such cases taken in the UK.

Info Box 1.5: Further guidance and policy on infected healthcare workers

There have been recorded cases where infected healthcare workers have transmitted BBVs to patients. In the UK, stringent policies restricting infected health care workers from performing procedures that put patient at risk have virtually eliminated transmission in this setting. Further guidance can be found below

AIDS/HIV infected health care workers: Guidance on the management of infected health care workers and patient notification. Available to download at: http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_4076770

Hepatitis B infected healthcare workers and antiviral therapy. Available to download at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_073164

Health clearance for tuberculosis, hepatitis B, hepatitis C and HIV: New healthcare workers. Available to download at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_073132

TABLE 2: Risk of transmission of blood borne viruses from patient to health care worker

Infection	Patient to health care worker
Hepatitis B	1 in 3
Hepatitis C	1 in 30
HIV	1 in 300

43 The risk of infection after muco-cutaneous exposure is much lower in the case of HIV (only one of more than 2000 health care workers followed up became infected). This means that the transmission risk after a single muco-cutaneous exposure is probably less than 1 in 1000 (0.1%).

44 A voluntary confidential reporting system for significant occupational exposure incidents involving HIV and HBV exists in the UK, to which practitioners who provide post-exposure care are asked to contribute. Further details may be obtained from the Health Protection Agency Centre for Infections for England, Wales and Northern Ireland, and Health Protection Scotland for Scotland. Mandatory reporting schemes exist for occupational exposures to blood borne viruses, (HBV, HCV and HIV), reportable to the Health and Safety Executive. A summary of appropriate reporting schemes is given in Part 4 of this guidance.

HIV

45 The number of health care workers that have become infected with HIV as a result of occupational exposure is small considering the frequency of exposure to blood and body fluids in clinical and laboratory work. A total of 106 documented and 240 possible international cases of HIV transmission due to occupational exposures have been reported through international surveillance centres or published in the literature until 2005. The total number of UK HIV documented seroconversions reported to 2005 was five cases (HPA data).

46 The greatest risk to health care workers of acquiring HIV is following a percutaneous injury involving a hollow needle that has been in the vein or artery of an HIV positive source patient, especially if that patient has late-stage disease and a high viral load. Exposed healthcare workers should provide a baseline blood sample for storage and be tested at 12 weeks anti-HIV antibodies. Occupational health providers should also monitor exposed individuals for at least six months in order that any relevant symptoms can be reported. If post exposure prophylaxis is prescribed (see Part 4), a repeat HIV test should be undertaken at six months

Hepatitis B

47 The number of cases of acute hepatitis B reported in health care workers has declined in recent years due to increased awareness of risk, adoption of safer working practices and widespread vaccination.

48 Based upon their legal duties, Department of Health recommends that all health care workers (including students and trainees) who have direct contact with patients' blood, bloodstained body fluids or patients' tissues, should be immunized against HBV. This includes those health care workers who are at risk of injury from blood contaminated sharps instruments, or of being deliberately injured or bitten by patients. Those who receive a primary course of the vaccine should be tested for their immune status 1-4 months post-vaccination, to determine if the health care workers require further management if they have not produced an adequately protective response to the vaccine.

Hepatitis C

49 Transmission of HCV through occupational exposure does occur, with the greatest risk of transmission from patients to health care workers being via needle stick injuries and other sharps exposures - there have been eleven seroconversions between 1997 and 2005, all of which have subsequently cleared the infection spontaneously or as a result of post-exposure therapy. Mucocutaneous exposures have also been documented, where the conjunctival mucosa is contaminated with blood stained body fluids. Serological surveys conducted to date show that HCV infection is detectable in health care workers but present evidence suggests that the prevalence is low and, in some countries, no higher than that found in the general populations.

50 HCW that are exposed to HCV by needlestick should be screened at 6 weeks for HCV RNA, and at 12 and 24 weeks for anti-HCV and HCV RNA. If the incident results in infection of the HCW, then treatment with pegylated interferon should be considered, which has a >95% clearance rate. For further information on post-exposure prophylaxis, please see Part 4 of this guidance.

Info Box 1.6: Further information on occupational transmission of BBV

Occupational transmission of HIV. Summary of Published Reports. March 2005 Edition (Data to the end of December 2002). Health Protection Agency Centre for Infections and Collaborators. Available to download at: http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1191942146589

Health Protection Agency Centre for Infections, National Public Health Service for Wales, CDSC Northern Ireland and Health Protection Scotland. Eye of the Needle. Surveillance of Significant Occupational Exposure to Blood Borne Viruses in Health Care Workers. November 2006. Available to download at: http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1208417858001?p=1208417858001

Department of Health. Hepatitis B, Chapter 18, Green Book. Department of Health, August 2006. Available to download at: http://www.dh.gov.uk/prod_consum_dh/idcplg?IdcService=GET_FILE&dID=115985&Rendition=Web

Hepatitis C Infected Health Care Workers. London, Department of Health, 2002. Available to download at: http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Healthservicecirculars/DH_4004561

Risk of transmission of blood borne viruses – Other Occupations

51 The risk to other occupational groups is likely to be significantly less than that posed to healthcare workers. Pre-exposure immunization against HBV is

recommended for individuals in occupations that place them at increased risk of exposure to BBV infection.

52 The Department of Health has identified the following occupational groups to be at an increased risk of exposure to BBV and recommended that they be immunised against HBV:

- Laboratory staff handling biological material that may be virally contaminated
- Staff of residential and other accommodation for those with learning difficulties
- Those handling human remains, such as morticians, embalmers and forensic pathologists
- Prison service staff in regular contact with inmates
- Emergency frontline responders, such as the police and fire and rescue services. For these workers, an assessment of the frequency of likely BBV exposure should be carried out prior to any vaccination.

53 Local government and sector-specific risk assessments have also concluded that the following occupational groups may also be at increased risk of exposure to BBV and recommended that they be immunised against HBV:

- Tattooists
- Ear and body piercers
- Beauticians and hairdressers
- Local authority services e.g. refuse disposal and street cleaners
- Sewage process workers
- Needle exchange service staff
- Those in professional and semi-professional contact sports

54 Designated First-Aiders in any occupational setting might be at increased risk. Further information on occupational sector-specific guidance can be found in the annexes to this document.

Part 2: Health and safety law

Overview

55 The Health and Safety at Work etc Act 1974 (ref 1), also referred to as HSWA, is the primary piece of legislation covering occupational health and safety in the United Kingdom. Under HSWA, employers have a duty to provide a safe place of work and protect the health and safety of their employees and others that may be affected by their work activities. It also places duties on employees to cooperate with their employer, so far as is necessary, to enable their employer to comply with his health and safety duties as set down under HSWA and under relevant legislation.

Figure 2.1: Overlap of duties of some legislation

Requirements	HSWA	COSHH	GMO(CU)	MHSWR	PPEWR	PUWER	RIDDOR
Health & Safety Management Systems	●			●			
Health & Safety Policies	●			●			
Access to Competent Advice			●	●			
Co-operation and Co-ordination				●			
Risk Assessment		●	●	●	●		
Control Risk of Exposure to Hazardous Substances	●	●	●	●	●	●	
Maintenance of Control measures	●	●		●	●	●	
Information, Instruction and Training	●	●		●	●	●	
Handling Incidents/Emergency Plans		●	●	●			●
Health Surveillance		●		●			

56 The main legislation of relevance to controlling the risks of exposure to blood-borne viruses at work is the Control of Substances Hazardous to Health Regulations 2002 (COSHH) (ref 2). There are, however, other health and safety regulations that overlap with COSHH and the main ones are shown in Figure 2.1. The requirements from these regulations are discussed below, together with those from other regulations not listed in Fig 2.1.

57 Where there is an overlap between pieces of legislation, the general rule is that the more specific requirement must be met. However, hazards and issues not covered by the specific legislation will need to be considered in the context of the more generic legislation. As such, this guidance will take you through each of your responsibilities in turn rather than concentrating on specific pieces of legislation. It will also reference other guidance documents for further reading.

Health and Safety Management

58 The legal responsibility for health and safety rests primarily with you, the employer. It is your responsibility to ensure the organisation has the necessary management framework to protect the health and safety of your staff and provide a safe working environment. By doing this you will achieve compliance with health and safety at work legislation. Further Information.

Info Box 2.1: Further information and some sector specific guidance on key elements of effective health and safety management systems can be found in:

- Successful health and safety management[7] (HSG65)
- Management of health and safety in the health service[8]
- University Health and Safety Management: Code of Best Practice[9]

Health and Safety Policies

59 All organisations employing 5 or more staff must have a written statement of their health and safety policy. For larger organisations, the overall health and safety policy may be supplemented by local policies and topic specific guidance. Protection against BBVs for example may merit specific guidance or be mentioned in a local policy, depending upon the type of business/organisation. Further Information.

Info Box 2.2: Further information on the formulation of health and safety policies and local procedures can be found in:

- An introduction to health and safety10
- Managing Health and safety: Five steps to success11

Access to Competent Advice

60 As an employer, you may need help and advice to carry out your duties under health and safety law. If that is the case, you must appoint one or more competent persons (that is, one who has sufficient training and experience or knowledge) to fulfil this role, for example, a health and safety advisor/assistant or safety officer. For biological agents matters they may require further support from a biological safety officer and/or referral to an infection control team. Further Information

Co-operation and Co-ordination

61 More than one employer, including the self-employed, may share some workplaces. For example:

- A laboratory in a teaching hospital may be shared by university researchers and NHS Trust biomedical scientists;
- Science parks may be owned and used by one organisation but also have space to let out to small businesses.

62 Those sharing a workplace must ensure there is co-operation and co-ordination to meet their respective duties under the law. Further Information

Consultation with Employees and Safety Representatives

63 By law, you must consult all of your employees, and employees' safety representatives, on health and safety matters. This is an important way to create and maintain a safe and healthy working environment. Further Information

Info Box 2.3: Further information on consultation with employees and safety representatives can be found in:

- Safety representatives and safety committees[12]
- A guide to the Health and Safety (Consultation with Employees) Regulations 1996. Guidance on regulations[13]
- Consulting employees on health and safety: A guide to the law14

Risk Assessment

64 The requirement to assess the potential risks from a work activity is central to most health and safety legislation. In the work place this is often broken down into five steps.

Info Box 2.4: Five steps to risk assessment:

1. Identify the hazards
2. Decide who might be harmed and how
3. Evaluate the risks and decide on precautions
4. Record your findings and implement them
5. Review your assessment and update if necessary

65 When assessing the risk associated with potential exposure to BBVs, don't overcomplicate the process. In many organisations, the risks are well known and the necessary control measures are easy to apply. You probably already know whether your employees could potentially be exposed to BBVs. If so, check that you have taken reasonable precautions to avoid injury. Further information related to the process of risk assessment is provided in Part 3 of this guidance (Controls measures against blood-borne infection). The information provided in Part 3 is designed to help you comply with the law**.**

66 There are additional requirements for more specialised work involving the deliberate handling and genetic modification of blood borne viruses. Further information on risk assessment, in general, and deliberate working with BBVs and genetically modified organisms can be found in Info box 2.5

Info Box 2.5: Further information on key elements of the risk assessment process can be found in:

- Part 3 of this guidance
- Five steps to risk assessment15
- Infection at work: controlling the risks16
- Biological Agents: Managing the Risks in laboratories and healthcare premises17
- A guide to the Genetically Modified Organisms (Contained Use) Regulations[18]

Controlling the Risks

67 Once you have performed your risk assessment, the methods you choose to adequately control the identified risks should, as far as possible, follow the hierarchical approach set out in the Management of Health and Safety at Work Regulations 1999 and COSHH, namely:

- Eliminating risk
- Controlling risk at source or by safer design
- Using physical engineering controls and safeguards*;* Supported by:
- Safe systems of work
- The use of personal protective equipment.

68 Further details on the processes that lie behind these principles are given in Part 3 of this guidance, (Controls measures against blood-borne infection). Part 3 of the guidance highlights these principles and provides further, detailed recommendations on how they can be implemented.

Minimising the risks through suitable systems of work

69 Systems of work are usually implemented by standard operating procedures or local codes of practice. Because they rely on individuals adhering to them, usually they are only used to supplement other control measures. Examples of such systems are:

- Laboratory rules – e.g. Prohibiting eating, drinking and smoking and the application of cosmetics in working areas where there is a risk of contamination
- Sharps policy - Avoiding the use of, or exposure to, sharps, such as needles, glass, etc.
- Waste disposal policy - Where sharps are unavoidable, safe disposal procedures such as the use of sharps bins made available at point of use, and forbidding the re-sheathing of needles.
- Decontamination and disinfection procedures - Effective decontamination of re-useable equipment (e.g. tattooing instruments, dental drills).

70 A summary of requirements designed to protect health care workers from BBV exposure is provided in The Health Act 2006: Code of practice for the prevention and control of healthcare associated infections, (known as The Hygiene Code - see

link in Info Box 2.6). This document includes requirements for occupational health service provision for health care workers, and for prevention and management of occupational exposure to BBV. Failure to observe 'The Hygiene Code' may either result in an Improvement Notice being issued to the NHS body by the Healthcare Commission, or in it being reported for significant failings and placed on 'special measures'.

71 Other information on regulations related to sharps is provided in Info Box 2.6.

Info Box 2.6: Medical Devices Regulations 2002 (as amended)[19]

Needles and many other medical sharps are covered by The Medical Devices Regulations 2002. As such, they should be designed and manufactured in such a way that, when used under the conditions and for the purposes intended, they will not compromise the clinical condition or the safety of patients, or the safety and health of users, or where applicable, other persons, provided that any risks which may be associated with their use constitute acceptable risks when weighed against the benefits to the patient and are compatible with a high level of health and safety.

In particular with regard to needles and other medical sharps and blood-borne viruses, the essential requirements state that devices must be designed in such a way as to eliminate or reduce as far as possible the risk of infection to the patient, user and third parties. The design must also allow easy handling and, where necessary, minimise contamination of the device by the patient or vice versa during use. It may be appropriate to consider the use of newer technology such as retractable needles, where the health and safety benefits may justify any additional cost.

- See also: The Health Act 2006: Code of Practice for the Prevention and Control of Health Care Associated Infections. At: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4139336

Personal Protective Equipment (PPE)

72 Although the principals of the hierarchical approach to control should be applied whenever practicable, there are some instances where PPE should be considered, i.e., where the risk to health and safety cannot be adequately controlled by other means or it would not be reasonable to implement other control measures.

73 When PPE is deemed necessary, consideration should be given to the type of PPE needed, its safe use, maintenance and disposal. Further information on the use of gloves can be found in Appendix 1.

74 Non-disposable PPE, e.g. laboratory coats, overalls or aprons, must be stored appropriately, checked and kept clean and, if faulty, repaired or replaced. (See Info box 2.7). If PPE may be, or has been, contaminated by blood or other body fluids, it must removed safely before leaving the workplace and kept apart from uncontaminated PPE and normal 'street' clothes. It should be cleaned and decontaminated or, if necessary, disposed of safely. Further Information

Info Box 2.7: Uniforms and PPE

Uniforms are not PPE as defined by the regulations[20] but protective clothing such as aprons may be worn over uniforms or normal clothing to control the risk of contamination. If there is contamination of uniform or personal clothing there should be spare clothing available for staff to use, e.g., disposable boiler suits, theatre scrubs etc.

Your risk assessment should identify how uniforms or protective clothing could become contaminated and how decontamination will be carried out.

75 In addition to the general controls outlined above, COSHH also specifies the minimum containment measures to be applied when intentionally working with biological agents, including BBVs, in laboratories, animal rooms and in industrial processes. (See Info Box 2.8)

Info Box 2.8: Further information on the containment measures required under COSHH when deliberately working with biological agents, including BBVs, can be found in:

- Control of Substances Hazardous to Health Regulations 2002 (As amended). Approved Code of Practice and Guidance[2]
- Biological Agents: Managing the risks in laboratories and healthcare premises17
- Safe Working and the prevention of infection in clinical laboratories and similar facilities, HSAC[21]
- The management, design and operation of microbiological containment laboratories[20]

Use and Maintenance of Controls

76 COSHH requires that your employees use the control measures you provide, including personal protective equipment (PPE), properly and that they report any problems with them. All reasonable steps need to be taken to ensure that the control measures are used, which includes provision of information and training, as well as appropriate supervision of employees. This may also include the requirement for use of a permit to work system[22]. Detailed considerations of controls is provided later in Part 3 of this guidance.

77 In addition to the above you must ensure:

- Equipment provided meets the requirements of the Provision of Work Equipment Regulations 1998 (PUWER), i.e., suitable and safe for use, and safely maintained. In this context, equipment also includes needles.
- Engineering controls used are kept in efficient working order and good repair.
- Non-disposable PPE is appropriately stored, checked, kept clean and, if faulty, repaired or replaced.

Further Information

Information, instruction and training

78 You have responsibilities under health and safety legislation to provide suitable and sufficient information, instruction and training for your employees.

79 Employees need to know:

- If they could be exposed to blood-borne viruses and how;
- The risks posed by this exposure - including any exposure limit;
- The main findings of your risk assessment;
- The precautions they should take to protect themselves and other employees, contract staff or visitors;
- How to use and dispose of any PPE that is provided; and
- What procedures to follow in the event of an emergency.

Further Information

Handling Incidents/Emergency Planning

80 The Regulations above require arrangements to be made to deal with emergencies. Emergency plans need to include:

- The foreseeable types of incidents, accidents or emergencies that might occur;
- The role, responsibilities and authority of individuals during an emergency;
- Procedures for employees to follow – including regular safety drills and identifying the special needs of any disabled employees;
- The safety equipment and PPE to be used;
- Arrangements for liaison with emergency services;
- First aid facilities, access to post-exposure prophylaxis and follow up through the occupational healthcare provider; and
- Procedures for cleaning up and disposal of waste

81 Under RIDDOR, you must report infections and dangerous occurrences with biological agents at work. Examples of dangerous occurrences include an accident or an incident arising out of the work, which could result in the release of a biological agent likely to cause severe human illness or infection, or a sharps injury involving a high risk patient. In addition, local records should be kept of all such incidents and the underlying cause(s) should be investigated and noted. Other voluntary reporting and surveillance schemes exist.

Further Information

82 Info Box 2.9 contains additional useful sources of information on the reporting process relevant to BBV occupational exposure events.

Info Box 2.9:

- The Reporting of Incidents, Diseases and Dangerous Occurrences Regulations 1995 (L73)[4]
- Biological agents: Managing the risks in laboratories and healthcare premises; Appendix 1.1. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
- Health Protection Agency - Reporting of occupational exposure to blood borne viruses – history and how to report[23]

Health Surveillance and Occupational Health

83 Where your employees are exposed to certain health risks, health surveillance is about you putting in place procedures to detect early signs of work-related ill health as well as managing these procedures, for example by acting upon the results. Although it is your statutory duty, you may use other competent persons, such as an occupational healthcare provider, to fulfil that duty.

84 Health surveillance is required if each of the following are met:

- The work is known to harm health in some way;
- There are valid ways of detecting the disease or condition;
- There is a reasonable likelihood that damage to health may occur under the particular conditions at work; and
- The surveillance is likely to benefit the employee.

85 Health surveillance for blood-borne viruses is probably unnecessary for many occupations. However, for occupations where contact with known or suspected infected patients or with contaminated materials is likely, additional control measures may be required. An example would be where healthcare staff are performing invasive clinical procedures on patients suspected of being infected with blood borne viruses. Blood borne viruses are all Hazard Group 3 biological agents and capable of causing persistent or latent infections with serious long-term consequences. Therefore, it is imperative to keep records as required under COSHH[2] (Regulation 11(3) and Appendix 2; Additional provisions relating to work with biological agents). Where health surveillance or monitoring is undertaken (usually by an occupational healthcare provider) you should keep an up to date record (health record) for each individual **but this should not contain the results of any monitoring or health surveillance**.

Further Information

Vaccination against Blood Borne Viruses

86 In the COSHH hierarchy of control measures, vaccination as protection against infection at work is the last line of defence and other controls should be available. However, for workers potentially exposed to blood borne viruses, such as healthcare and biomedical laboratory staff, vaccination is an appropriate additional measure.

87 Info Box 2.10 outlines the regulatory principles of vaccination use for protection against blood-borne viruses. Currently a safe, effective vaccine is only

available for protection against hepatitis B. Additional antiviral treatments are available for hepatitis B, hepatitis C and HIV, where post-exposure assessment by a clinician deems it appropriate (see Part 4 of this guidance). Hepatitis C is only treated if the exposed person is confirmed as positive for the virus. Further details on considerations prior to Hepatitis B vaccination are given in Part 3 of this guidance.

Info Box 2.10: Immunisation

Under COSHH requirements:

If a risk assessment shows that there is a risk of exposure to biological agents, and effective vaccines exist, then provision should be made to determine whether an employee is already immunised, and vaccination should be offered to those not already immunised. The pros and cons of immunisation/non-immunisation should be explained when making the offer.

You should also be aware that the Health and Safety at Work Etc Act prevents employees having to pay for protective measures such as immunisation.

As with all control measures, vaccination needs to checked and reviewed and boosters provided where deemed necessary. It is recommended that immunity of employees is assessed before or after vaccination to provide an indication as to the necessity and effectiveness of the vaccination and inform the risk assessment as to whether additional control measures are required for that individual or work activity. Where the work involves deliberate handling of the virus, then this assessment forms part of the decision regarding their fitness to work with that particular biological agent. The decision on the effectiveness of the vaccination needs to be made available to the managers who take responsibility for deploying staff to work with potentially infectious patients or specimens, and with the consent of the individual, this information should form part of employee's health record, to be held by management.

Further information regarding Hepatitis B vaccination can be found at:

- Department of Health - Immunisation against infectious disease - "The Green Book"[24]
- Department of Health - Guidance for clinical health care workers: protection against infection with blood-borne viruses[25]

Final decisions on immunisation should be made on the basis of a local risk assessment. In settings where the client's behaviour is likely to lead to significant exposures on a regular basis (e.g. biting), the DH Green Book indicates that it would be prudent to offer immunisation to staff even in the absence of documented hepatitis B transmission.

Further Information

Do you need further information?

Here are some legal aspects in more detail

Health and Safety Management

Management of Health and Safety at Work Regulations 1999 – Regulation 5

The legal responsibility for health and safety rests primarily with the employer. It is their responsibility to ensure the organisation has the necessary management framework to protect the health and safety of their staff and provide a safe working environment. By doing this they will achieve compliance with health and safety at work legislation. This means taking an active role in carrying out risk assessments, setting health and safety standards and developing policies, together with the monitoring of standards and enforcement of compliance, where necessary. Specific functions, such as carrying out risk assessments, may be delegated to others, but ultimate responsibility for health and safety cannot be delegated.

Health and Safety at Work etc Act 1974 – Section 2(3)

Management of Health and Safety at Work Regulations 1999 – Regulation 5

All organisations employing 5 or more staff must have a written statement of their health and safety policy. This should be a declaration of their intent to provide and maintain a safe and healthy working environment, and should also be used to gain the support of their employees towards achieving these ends. It should detail health and safety responsibilities within the organisation and arrangements for ensuring health and safety in the workplace. It may refer to other documentation such as risk assessments, local codes of practice and standard operating procedures and should be brought to the attention of all employees.

Depending upon the size of the organisation, the overall health and safety policy may be supplemented by local policies and topic specific guidance. Protection against BBVs for example may merit specific guidance or be mentioned in a local policy, depending upon the type of business / organisation. Local policies should reflect the overall health and safety policy for the business (that is, to develop and maintain a safe working environment, a commitment to ensuring the health and safety of their employees and ensuring its importance is recognised by employees), but may be used to place it in a context specific to that area of the business. Local codes of practice can give further information on how safe working will be achieved on a day-to-day basis. Local safety policies and codes should be made freely accessible and all employees, including new starters and temporary workers, must be made aware of them.

Management of Health and Safety at Work Regulations 1999, Regulation 7

Employers may need help and advice to carry out their duties under health and safety law. There is a requirement to appoint one or more competent persons to fulfil this role. In general terms this may be a health and safety advisor/assistant or safety officer, but for biological agents they may be supplemented by a biological safety officer and/or infection control team. They need to have the status and competence to advise management and employees or their representatives with authority and independence. A competent person is one who has sufficient training and experience or knowledge to do the required job. This will include an understanding of relevant statutory requirements and an appreciation of the hazards involved. The person appointed does not have to be employed by the employer but does need to know all the factors arising from the employer's work that may affect health and safety.

Those providing the advice/help must be given enough time and resources to fulfil their responsibilities. It is also important to remember that appointing a competent person does not absolve the employer from their responsibilities under health and safety law, it just gives further assurance that their responsibilities will be fulfilled adequately. Depending on the nature of the work and size of organisation, for specific advice on risk of infection it may be more practical to obtain competent advice outside the company.

Management of Health and Safety at Work Regulations 1999, Regulation 11

More than one employer, including the self-employed, may share some workplaces. For example:

- A laboratory in a teaching hospital may be shared by university researchers and NHS Trust biomedical scientists;
- Science parks may be owned and used by one organisation but also have space to let out to small businesses.

There is a requirement for those sharing a workplace to ensure that there is co-operation and co-ordination to ensure that respective duties under the law are met. Everyone in the workplace needs to be sufficiently informed about **all** the risks to which they may be exposed, for example, by exchanging information about the nature of the work being undertaken.

If there is no controlling employer in charge of the workplace, then those using the workplace will need to agree joint arrangements, for example the appointment of a health and safety co-ordinator, to meet the requirements of the law.

Once arrangements are agreed, it is recommended that these are documented and signed by all those concerned.

Safety Representatives and Safety Committees Regulations 1977

Health and Safety (Consultation with Employees) Regulations 1996

By law, employers must consult all of their employees on health and safety matters. Where safety representatives have been appointed by a trade union, these may represent the employees in consultations on health and safety with the employer. Consulting employees on health and safety matters is an important way to create and maintain a safe and healthy working environment. By consulting employees, an employer should motivate staff and make them aware of health and safety issues. It has been statistically proven that by doing this organisations can become more efficient and reduce the number of accidents and work-related illnesses.

Control of Substances Hazardous to Health Regulations 2002, Regulation 12

Management of Health and Safety at Work Regulations 1999, Regs 11 & 13

Provision and Use of Work Equipment Regulations 1998, Regs 8 & 9

Employers have responsibilities under health and safety legislation to provide suitable and sufficient information, instruction and training for their employees.

Employees need to know:

- If they could be exposed to blood-borne viruses and how;
- The risks posed by this exposure;
- The main findings of your risk assessment;
- The precautions they should take to protect themselves and other employees;
- How to use and dispose of any PPE that is provided; and
- What procedures to follow in the event of an emergency.

You will need to ensure that employees are kept up to date with any changes that could affect the risk and, if necessary, provide further training. The training that is provided needs to be appropriate to the level of risk involved, and in a format that will be well understood by the employee, taking into account their capabilities. You also need to evaluate the training to ensure it has achieved the desired outcome.

You should also ensure that other people who may be affected by the work, e.g., maintenance staff, cleaners or external contractors, receive sufficient and appropriate information, instruction and training about the hazards they may encounter. They should also be appropriately supervised whilst carrying out the work. One means of ensuring that work is carried out safely is to use a permit-to-work system[22].

Control of Substances Hazardous to Health Regulations 2002, Regulation 13

Management of Health and Safety at Work Regulations 1999, Regulation 9

Reporting of Diseases, Injuries and Dangerous Occurrences Regulations 1995

The Regulations above require arrangements to be made to deal with emergencies. Emergency plans need to include:

- The foreseeable types of incidents, accidents or emergencies that might occur;
- Any specific hazards likely to arise at the time of an emergency;
- The role, responsibilities and authority of individuals during an emergency;
- Procedures for employees to follow – including regular safety drills and identifying the special needs of any disabled employees;
- The safety equipment and PPE to be used;
- Arrangements for liaison with emergency services;
- First aid facilities; and
- Procedures for cleaning up and disposal of waste.

One foreseeable accident, where the use of sharps is unavoidable, would be a puncture wound with a sharp that may be contaminated with a blood-borne virus. You should consider what procedures the employee should follow, what support will be provided, and by whom. More information regarding the actions to be taken following a potential exposure can be found in Part 4.

Under RIDDOR, there is a statutory requirement to report infections at work and dangerous occurrences that result in, or could have resulted in, the release of a biological agent that could cause severe infection. This therefore applies to BBVs. Incidents such as a puncture wound from a needle known to contain blood, which may be contaminated with a blood-borne virus, should be reported as a dangerous occurrence.

In addition, local records should be kept of all incidents, including near misses, involving material potentially contaminated with blood-borne viruses. This allows the identification of problem areas and allows checks to be made on the effectiveness of control measures already in place.

You may wish to consider reporting any incidents to a national surveillance scheme such as the Health Protection Agency's 'Eye of the Needle' scheme[26].

Control of Substances Hazardous to Health Regulations 2002, Regulation 11

Management of Health and Safety at Work Regulations 1999, Regulation 6

For employees exposed to certain health risks, health surveillance is about putting in place procedures to detect early signs of work-related ill health as well as managing these procedures, for example by acting upon the results. Although the statutory duty lies with the employer, it may require the use of other competent persons, such as an occupational healthcare provider.

Health surveillance is required if each of the following are met:

- The work is known to harm health in some way;
- There are valid ways of detecting the disease or condition;

- There is a reasonable likelihood that damage to health may occur under the particular conditions at work; and
- The surveillance is likely to benefit the employee.

In practice, health surveillance for blood-borne viruses is probably unnecessary for many occupations where exposure to blood or other body fluid is likely to be rare or infrequent. It should be considered for employees who are likely to be exposed to potentially contaminated blood on a regular basis. This could include, for example, pre-employment screening to see if workers are immune to Hepatitis B, and providing immunisations. Where any health surveillance or monitoring is undertaken you should keep an up to date record for each individual and there is a requirement that these records should be kept for 40 years. This 'health record' (as defined in COSHH Regulation 11) should include:

- Personal details of the individual
- A historical record of work with or exposure to blood borne viruses
- Dates of any immunisations and the results of any checks on immunity. This should also address the individual's fitness for work or any specific precaution that should be taken.

As the health record needs to be accessible by the employer/manager to help inform local risk assessments and for appropriate controls to be put in place, it should not include any confidential clinical information. For example, a manager may need to know whether or not a person is fit to work with blood borne viruses, based on information from the occupational healthcare provider about the employee's immunity to Hepatitis B, but the manager does not need to know their level of immunity, nor any reasons for lack of immunity. This more detailed information could be kept with their clinical records by the occupational healthcare provider.

Where an employee declines to be immunised, or to allow their immunisation data to be placed on their health record, the occupational healthcare provider will not be able to confirm their immunity status. Their manager will then need to decide whether the employee can work with infectious patients or specimens based on the level of risk, and whether additional precautions are necessary based on the level of risk.

Control of Substances Hazardous to Health Regulations 2002, Regulation 7

Personal Protective Equipment at Work Regulations 1992, Regs 4 & 10

Although the principles of the hierarchical approach to control should be applied whenever practicable, there are some instances where PPE should be considered. These include:

- Where other control measures are not reasonable to implement. For example, whilst a motor vehicle repair garage may occasionally have to recover a blood contaminated car following a road traffic accident, they would not be expected to have any engineering controls to minimise the risk from blood borne viruses. In such, instances the use of PPE such as gloves and overalls, if necessary, would be appropriate.
- Wherever the risk to health and safety cannot be adequately controlled by other means. For instance, it would be expected that a healthcare worker taking blood would wear gloves, even though they would also be following safe systems of work and potentially using safer devices.

When PPE is deemed necessary, consideration should be given to the type of PPE needed, its safe use, maintenance and disposal. Further information on the use of gloves can be found in Appendix 1

Any non-disposable PPE, e.g., laboratory coats, overalls or aprons, must be stored in appropriate facilities (separately from usual outdoor clothing), checked and kept clean and, if faulty, repaired or replaced. If PPE may be or has been contaminated by blood or other body fluids, it must removed safely before leaving the workplace and kept apart from uncontaminated PPE and normal 'street' clothes. It should be cleaned and decontaminated or, if necessary, disposed of safely.

In addition to the general controls outlined above, COSHH also specifies the **minimum** containment measures to be applied when intentionally working with biological agents, including BBVs, in laboratories, animal rooms and in industrial processes.

Control of Substances Hazardous to Health Regulations 2002, Regs 8 & 9

Personal Protective Equipment at Work Regulations 1992, Regulation 7

Provision and Use of Work Equipment Regulations 1998 (PUWER)

COSHH requires that your employees use the control measures you provide, including personal protective equipment (PPE), properly and that they report any problems with them. All reasonable steps need to be taken to ensure that the control measures are used, which includes provision of information and training, as well as appropriate supervision of employees.

Any equipment provided for use at work has to meet the requirements of PUWER. These regulations require that the equipment you provide for use at work is suitable for the purpose for which it is to be used, safe for use, maintained in a safe condition and, in certain circumstances, inspected to ensure this remains the case. Where the use of the equipment is likely to involve a specific risk to health or safety, use of the equipment should be restricted to those people who need to use it and who have been trained to use it.

If you use any engineering controls then you need to ensure that they are kept in efficient working order and good repair. You will need to carry out regular and documented examination and testing of the controls. In the case of local exhaust ventilation, for example microbiological safety cabinets (MSC), or room air HEPA filtration systems, this needs to take place at least every 14 months (in practice, annually but with allowance for 'slippage'). However, it is advisable for equipment such as MSC to be examined more frequently, as well as checks on their airflow function just before use.

Any non-disposable PPE, e.g., laboratory coats, overalls or aprons must be stored in appropriate facilities (separately from usual outdoor clothing), checked and kept clean and, if faulty, repaired or replaced.

Part 3: Control measures against blood-borne infections

Guidance on safe working practices

88 Guidance on safe working practices for health care workers has been published by the UK Health Departments[27] using a task-related approach to the application of controls. This approach considers the potential risk of exposure to BBV from exposure prone procedures such as major surgery (highest risk), including obstetrics and gynaecology, cardiothoracic and trauma orthopaedic; also arterial puncture; insertion/removal of intra-arterial lines; and the simple administration of injections etc (lowest risk). Emphasis is placed on assessing the exposure-prone nature of procedures, the risk of penetrating injury and the scale of exposure, rather than on attempting to define the risk from any particular individual. The principles described, i.e. increasing levels of protection according to the task and foreseeable degree of exposure to blood or body fluids is applicable in other occupations.

Effective consideration of risk and its control

89 Building on the legal responsibilities of COSHH explained in Part 2, the following steps outline the practicalities of risk assessment, to determine whether specific controls against BBV exposure are required:

1) Identify the hazards associated with your work activity
   - Sources of BBVs
   - How might people be harmed?
   - Exposure to pathogens – nature of the organism
   - How might exposure occur?

2) Consider who will be exposed and the consequences
   - Who might be harmed (e.g. nurses, cleaners)?
   - Identify groups of people – involve them in the assessment process
   - What type of ill health or disease will result?

3) Assess how likely it is that harm will arise
   - Probability in light of findings in (1) and (2) above
   - Characteristics of the organism e.g. infectious dose, survival time
   - Frequency of contact/exposure
   - Standard work practice

4) Assign control measures** to mitigate risk (if appropriate)

   - Engineering controls and work practices
   - Microbiological safety cabinets
   - Sharps policy – see below
   - Personal Protective Equipment (PPE)
   - Decontamination procedures
   - Spill procedures and fumigation
   - Vaccination – not strictly a control, rather a protective measure

**These are typically applied as a hierarchy, for example: using overarching work practices and engineering controls (e.g. general ventilation) → local engineering controls (e.g. use of cabinets, local exhaust) → decontamination procedures → PPE → vaccination

5) Implement actions to maintain controls

- Planned preventative maintenance (e.g. cleaning, inspection, maintenance)
- Booster vaccinations

6) Risk assessment review

- Significant changes (e.g. working practices)
- New information
- Equipment maintenance

Further Information is available at the end of Part 3 of this guidance.

Recognising the potential sources of blood-borne infection

90 Effective control starts with the ability to accurately recognise the potential sources of BBV infection. The most commonly encountered sources are as follows:

Infected people - the public, patients, clients

91 Experience to date has shown that BBV transmission to workers or the public is very unlikely through everyday social contact with BBV-infected individuals. Transmission is associated invariably with direct exposure to blood or body fluids and a means of delivering them through the protective skin barrier. In the occupational setting this is most likely to result from a penetrating injury with a contaminated sharp instrument, such as a needle, broken glass or contaminated machinery/vehicles; and more rarely when there is contamination of broken skin or mucous membranes. Sport, however, may constitute social and/or work exposure, and studies of this topic support the potential for infection by this route. There are impact injuries associated with sports such as wrestling, football and rugby, which result in bloody injuries and a potential risk of blood-borne transmission of hepatitis B and C, and HIV. Recommendations have been made that those involved in contact sport should receive hepatitis B immunisation (for relevant references see Info Box 3.1).

92 Attending motor vehicle accidents can present risk of infection from contaminated wreckage and needs to be considered by a range of occupations attending these sites.

Infected bodies

93 When a body has suffered injury (e.g. in a road traffic accident), has undergone surgery just before death, or a post-mortem examination, there is a potential risk of blood-borne transmission and appropriate protective measures should be taken. A review of risks associated with cadaveric testing describes how viable, cell-free HIV in tissue culture fluid could be detected for up to 15 days at room temperature (ref 28), though such studies have used high-titre inocula far in

excess of levels found naturally in infected individuals. HBV has been reported to survive for several weeks in blood outside the human body and is known to have a high blood titre in infected individuals. Lengthy survival can also be expected for HCV, though this virus has demonstrated a greater loss of titre compared with HBV over several months (ref 29). Unless there is leakage of blood or fluids there is little risk of infection of this nature, and simple hygiene measures would be adequate to prevent it. However, whilst hygienic preparation is acceptable, BBV infected bodies should not be embalmed as this presents significant risk of exposure to workers. Further information sources are provided in Info Box 3.1.

Info Box 3.1: Additional information sources related to work activity and infection risk from BBV

- *Selda Bereket-Yücel. 2007. Risk of Hepatitis B Infections in Olympic Wrestling. Br. J. Sports Med. 41: 306 - 310.*
  http://bjsm.bmj.com/cgi/content/abstract/bjsm.2006.032847v1
- *Kordi R, Wallace WA. 2004. Blood borne infections in sport: risks of transmission, methods of prevention, and recommendations for hepatitis B vaccination. Br J Sports Med. 38(6):678-84; discussion 678-84. At. http://bjsm.bmj.com/cgi/content/abstract/38/6/678*
- *Stacey A. & B. Atkins. 2000. Infectious Diseases in Rugby Players: Incidence, Treatment and Prevention. Sports Med. 29, Number 3, 211- 220(10). Link*
  http://www.ingentaconnect.com/content/adis/smd
- *Zeigler, T.A. 1997. Management of blood borne infections in sport – a practical guide for sports health care providers and coaches. ISBN 08801 1682X.*
- *Infection at work: controlling the risks from human remains. At: Link:*
  http://www.hse.gov.uk/aboutus/meetings/acdp/140904/annex1.pdf
- *Safe working and the prevention of infection in the mortuary and post mortem room (HSE Books, 2005).*

Contaminated objects

94 Any article contaminated with blood or blood products from an infected person must be regarded as a potential source of BBV infection for those handling it, if a means of delivering the virus into the body exists. Examples include sharp objects (see below), but also ‘soft’ waste such as discarded dressings, contaminated clothing, linen and furnishings. Hard and soft surfaces of damaged motor vehicles can also harbour contamination following road traffic accidents. Although BBV do not remain infectious indefinitely at ambient temperatures, or when exposed to sunlight and humidity, it must be assumed that there is a risk of infection unless the item concerned has been decontaminated by an effective means. Cell-free and cell-associated HIV cultures suspended in 10% serum have been found to remain infectious for several weeks at room temperature (ref 30). Hepatitis B virus is particularly hardy and may remain infectious for some months in dried material. Re-used medical devices may therefore require specialist attention, e.g. before repair or service.

Sharps

95 Sharps include any items that can cause laceration or puncture wounds. They present a special hazard if there is contamination by blood and, although they may not be visibly soiled, they should be handled with care if contamination is known or suspected. Examples include: discarded hypodermic needles; instruments used in invasive operations (e.g. blood-sampling, surgery, dentistry, acupuncture, ear-piercing and tattooing); emergency services' cutting equipment, broken glass and jagged metal. For safety and security, small sharps should be placed in sharps disposal containers or otherwise suitably contained or guarded until decontaminated or incinerated. There should **never** be a need to re-sheath a used syringe needle, and by using an appropriate sharps container this can always be avoided. Whenever possible, separation of needle from syringe should also be avoided as this increases the risk of blood spillage and sharps injury. There are a number of initiatives to reduce the number of contaminated sharps injuries, including the use of safer needle devices and needle exchange programmes.

Equipment (including medical devices)

96 Medical, dental, laboratory or other equipment that is reusable and has been in contact with blood or body fluids, and which has not been decontaminated adequately, may present a risk of infection for both workers and patients. Reusable devices must therefore be decontaminated between uses on different individuals. If an item of equipment is to be sent for examination or repair, it should, wherever possible, be decontaminated before despatch. In some instances, e.g. such for delicate items such as where electrical componentry is present, some methods of decontamination may cause damage to the equipment. To avoid this, the most appropriate method must be chosen, and guidance is available on decontamination (ref 31), appropriate safe procedures for consignment (ref 32) and includes a model certificate of declaration that should accompany the returned equipment. Work on site should also be subject to issue of a declaration indicating the contamination status of the item and the need for precautions. Service companies should be informed in advance where full decontamination is not practicable. Specific requirements are necessary where there is a risk of Transmissible Spongiform Encephalopathy (TSE) contamination of re-useable instruments, detailed information is available on this and related TSE topics (ref 32)**.**.

Motor Vehicles

97 Vehicles involved in traffic accidents are commonly contaminated with blood. Sharp metal and broken glass present an added risk of puncture wounds for those dealing with recovery and repair work, so potential for cross infection does exist. However, Government ill-health data indicate that there are currently no confirmed reports of BBV transmission for the motor vehicle recovery and maintenance industry, and that most industry-specific problems are related to musculoskeletal injury, slips and trips, fume, dusts, noise and vibration (http://www.hse.gov.uk/mvr/stats.htm). Discarded hypodermic needles are, however, sometimes found in upholstery and glove compartments in cars sent for repair and servicing, and workers need to be aware of this, even during routine maintenance work. Precautions are essential in all cases and additional information for the motor vehicle industry is available via the HSE Web site.

Environmental contamination

98 Blood and body fluids may contaminate the site of industrial and road traffic accidents, playgrounds and sporting events. Provided that there is no direct contact, there is no risk for those in the vicinity. It should, however, be remembered that the viability of BBV on surfaces can continue for extended periods, as described above (Contaminated objects). The use of simple personal protective measures, avoidance of sharps injuries and appropriate decontamination will minimise the risk for those dealing with the contamination. After cleaning up, it is essential to dispose of contaminated waste safely; a topic covered in subsequent sections.

Safe procedures

Precautions applicable to all exposed occupations

99 It is not possible for employers to totally eliminate the risks posed by BBVs in their workplace, because there is always the possibility of accidents where first-aiders and/or colleagues could be exposed when working. Employers are, however, required to adequately control exposure and protective measures applicable to all occupations are listed below in Info Box 3.2. Where possible contact with blood or bodily fluids should be avoided and restricted to those with appropriate training in handling these products. These control measures, along with any necessary adaptation to local circumstances, must also take account of any potential exposure of patients and members of the visiting public, including contractors. Where appropriate, PPE most often required to avoid contamination consists of simple items such as gloves, goggles or visor and disposable clothing protection, such as plastic aprons. Specific guidance exists for many individual occupations, and examples are provided in Appendix 3.

100 The following steps (Info Box 3.2) will minimise the risk of exposure to blood products and any associated BBV, but not all will be necessary in all situations:

Info box 3.2: Minimising the risk of exposure to blood products and BBV

- Do avoid contact with blood or bodily fluids
- Do take all necessary precautions to prevent puncture wounds, cuts and abrasions in the presence of blood and body fluids;
- Do avoid use of, or exposure to, sharps (needles, glass, metal etc) when possible and discard sharps directly into the sharps container immediately after use, and at the point of use;
- *Do take particular care in handling and disposal if use of sharps is unavoidable – one use only contaminated sharps must be discarded in to an approved sharps container. This must be constructed to BS 7320; 1990 / UN 3291, and used containers must be disposed of through a waste management company who will dispose of them safely as **'waste for incineration only'**;

- **Do protect all breaks in exposed skin by means of waterproof dressings and/or gloves (See Appendix 1);
- Do protect the eyes and mouth by means of a visor or goggles/ safety spectacles and a mask when splashing is a possibility (this will also protect against bone fragments in orthopaedic surgery and post-mortem examination);
- Do avoid contamination of the person or clothing by use of waterproof/water-resistant protective clothing, plastic apron etc;
- Do wear rubber boots or plastic disposable overshoes when the floor or ground is likely to be contaminated;
- ***Do apply good, basic hygiene practices including hand-washing before and after glove use, and avoid hand-to-mouth/eye contact;
- Do control surface contamination by blood and body fluids by containment and appropriate decontamination procedures; and
- Do dispose of all contaminated waste safely and refer to relevant guidance (see below) if you are uncertain how to classify and dispose of your waste.

*The use of disposable (one use only) items is generally safer and more practical than attempting to recycle contaminated items;

**Chain mail and armoured gloves are available to protect the hands when working with sharp instruments or when exposed to bone splinters etc.

Disposable gloves should **never be washed and re-used because they may deteriorate during use and in washing. If latex gloves are worn, powder free, low protein products should be chosen to help prevent latex allergy. Any disposable gloves should be CE marked for use with biological agents.

Laboratory-based work

101 The deliberate handling of biological materials in laboratories may necessitate special requirements (ref 33) for control measures. However, even where employees need to handle blood as part of their work, employers can take steps to minimise the risk of exposure to BBVs, for example, by the substitution of unscreened blood for screened blood etc. The design and selection of suitable work equipment for particular tasks and processes make it possible to reduce or eliminate many risks posed by blood-borne viruses. The use of many types of equipment at work needs to meet the requirements of PUWER (ref 34) (e.g. selection, application, training, maintenance).

Controlling the risks at source or by safer design

102 Collective protective measures should take preference over personal protective equipment, and examples are provided in Info Box 3.3:

Info Box 3.3: Equipment use: designing in risk control measures

- Do use a microbiological safety cabinet when work could create infectious aerosols
- Do use interlocks on diagnostic equipment used to analyse blood or other body fluids,
- Do use safer needle devices and/or blunt ended scissors to prevent and control inoculation injuries.
- Do use appropriate equipment for the job, PUWER regulations require that the equipment you provide for use at work is:

  1 Suitable for its intended use;

  2 Safe for use;

  3 Used only by people who have received adequate information, instruction and training;

  4 Accompanied by suitable safety measures, e.g., protective devices, markings and warnings; and

  5 Designed and manufactured in compliance with any essential requirements set down in certain Community Directives regarding the safety of products

Disposal of Waste – Overview

103 The safe disposal of all hazardous waste is part of the statutory duty of employers and the self-employed under the HSWA, COSHH and Hazardous Waste regulations made under the Environmental Protection Act (Ref 35). BBV contaminated waste must be regarded as a hazardous substance unless rendered safe before disposal. Most waste of this type, depending on its origin, will be classified as 'clinical or infectious waste' and is subject to stringent controls.

104 The principles of waste segregation and its secure storage are applicable in most occupational settings where any significant amount of waste is generated. This will include material generated in, for example, the care of patients in the community. Waste of this nature is most likely to fall into the Category B infectious waste, requiring labelling as UN3291 and packaging in bags/wheelie bins as per packaging instruction P650. Detailed guidance on management and handling of infectious healthcare waste is provided by Department of Health (HTM) 07-01. (Ref 36)

Contaminated soft waste handling and disposal

105 The Royal College of Nursing (RCN) provides detailed guidance on waste disposal for their membership, and this usefully includes advice for those staff working in the community setting (Ref 37).

106 **The clinical setting:** In addition to sharps waste management requirements, used gloves, aprons, swabs, dressings and other non-sharps materials that are contaminated with bodily fluids do require segregation if generated in quantity by work-related activity. Within the clinical setting, this waste is likely to be assumed infectious and will be disposed of as Category B waste. This must be disposed of in orange-lidded bin or bag, and by licensed or permitted treatment facility for incineration.

107 **The non-clinical settings, e.g. the domestic care setting:** In the non-clinical setting and where, following a risk assessment, it is determined that the waste is not derived from an infected individual, then the material would be defined as offensive/hygiene waste. This is waste that is healthcare related waste, or similar waste from municipal sources, which meets the following criteria:

- It is not clinical waste;
- It is not dangerous for carriage;
- The producer has identified, after segregation at source, that it is suitable for disposal at a non-hazardous landfill site without further treatment; and,
- It may cause offence to those coming into contact with it.
- Offensive/Hygiene waste should **not** contain human/animal body parts, organs or blood products;

108 Smaller volumes of such waste, such as those which may be used by householders; i.e. plasters, pads, small dressings, stoma bags etc may go into a black or grey (opaque) bag and be discarded as household waste if the householder agrees.

109 However, when generated in quantities of more than 7 kg during any collection interval, this waste must be disposed of in yellow bags with a black stripe (also known as ‘Tiger bags’). All offensive/hygiene waste of this kind must be postcode labelled and kept in a designated, secure area until collected.

Avoiding sharps injuries - staying ‘sharps safe’

110 For some the use of sharps cannot be avoided totally (e.g. health care settings) and guidance for health care workers on 'exposure-prone procedures' is available (Ref 38) to assist the process of risk assessment for such activities. In the past many inoculation accidents have occurred as a result of re-sheathing used hypodermic needles, but modern blood-taking devices negate the need for traditional syringes in most cases and make blood taking safer. If sharps disposal bins are not immediately available, or if the working environment makes their immediate use impractical, then smaller needle securing systems exist, which enclose sharps from syringe-needles and render them safe for handling after use. If used, these systems must then be disposed of by incineration.

The image sequences within the following publication are helpful for illustration purposes:

111 Health Protection Agency (2003). **Examples of good and bad practice in avoiding sharps injuries.** Available from: http://www.hpa.org.uk/infections/topics_az/bbv/good_bad.htm

112 Needles and syringes collected in public places have also been proven to contain BBV contamination (Ref 39), and such materials should never be handled if found, but should be reported to the local authority responsible for the site. Those working in the refuse collection and recycling industry should themselves be aware of the risks from discarded drug-litter and HSE guidance is available for this sector (reference 'Handling needles in the waste & recycling industry' – and can be downloaded from www.hse.gov.uk/pubns/waste19.pdf).

113 The basic steps for remaining 'sharps safe' are summarised in Info Box 3.4.

Info Box 3.4: Avoiding sharps injury and staying 'sharps safe'

- Do discard any sharps directly into the sharps container immediately after use and at the point of use. Close the aperture to the sharps container when carrying or if left unsupervised, to prevent spillage or tampering;
- Do carry sharps containers by the handle - do not hold them close to the body;
- Do lock the container when it is three-quarters full using the closure mechanism;
- Do label sharps containers with premises / departmental address prior to disposal;
- Do place any damaged sharps containers inside a larger sharps container - lock and label prior to disposal - do not place this or anything sharp inside a yellow hazardous waste bag as it may cause injury;
- Do keep all sharps waste in a designated, secure area until it is collected;
- Do dispose of disposable razors to a sharps bin immediately after use. Razors should never be re-sheathed after use;
- Do not try to re-sheath any used needles, should they be supplied sheathed;
- Do not leave sharps lying around and don't try to retrieve items from a sharps container;
- Do not try to press sharps down in the container to make more room;
- Do not place sharps containers on the floor, window sills or above shoulder height – use wall or trolley brackets, they should be stored above knee level and below shoulder level;
- Do not bend or break needles before discarding them. They and other contaminated sharps such as lancets, broken glass or sharp metal should be placed promptly in disposal containers of a type approved under BS 7320; 1990 / UN 3291; and

- Do not use makeshift containers such as drinks cans, bottles or cardboard boxes as sharps disposal. They are not adequate for the purpose and may find their way into domestic waste and present a hazard to refuse workers and members of the public.

The Medicines and Healthcare Products Regulatory Agency (MHRA), provides further information on the safe use and disposal of sharps (Ref 40).

Immunisation as a protection measure

114 The risks from exposure to BBVs must be assessed under COSHH Regulations, and must then legally bring into effect any measures necessary to protect workers and others from infection risks, as far as is reasonably practicable. The legal responsibilities for this process are provided in Part 2 of this guidance. The provision of routine pre-exposure immunisation may be appropriate in certain cases, e.g. in exposure prone occupations, for those not already immune. Employers need to be able to demonstrate that an effective employee immunisation programme is in place, and they have an obligation to arrange and pay for this service. For larger employers immunisation programmes are often managed by occupational health services with appropriately qualified providers, and the British Medical Association recommends specialist occupational health support for groups such as the Police, health professionals and medical students. Smaller businesses are more likely to rely on local GP support for such services, but should also consider the services of a dedicated occupational health provider. If GP support is used, an appropriate letter to accompany the employee and to explain the reasons behind the immunisation request would be appropriate.

115 There are currently no vaccines available against hepatitis C or HIV, although there are measures that can be taken following exposure, which may prevent the development of infection. Studies have indicated, however, that antiviral therapy does not prevent acquisition of infection following hepatitis C exposure (**CDC**), though there is evidence that therapy given shortly after acquisition is more successful, in terms of a sustained viral response, than therapy given later. Such treatment should be seen as distinct from post-exposure 'prophylaxis'. Post exposure prophylaxis and its implementation, is covered in more detail in Part 4 of this document.

116 A safe and effective vaccine for the prevention of hepatitis B infection is available. Pre-exposure vaccination is strongly advised for all workers who may be exposed to blood, body fluids or tissues as part of their work activity. The UK Department of Health (Ref 41) identifies those workers at increased risk as:

- Healthcare workers in the UK and overseas (including students and trainees);
- Laboratory staff handling biological material that may be virally contaminated;
- Staff of residential and other accommodation for those with learning difficulties;

- Occupational risk groups handling human remains, such as morticians and embalmers;
- All prison service staff in regular contact with prisoners: and
- Frontline responders e.g. police and fire and rescue services. For these workers, an assessment of the frequency of likely BBV exposure should be carried out prior to any vaccination.

117 Other occupational groups who may be at risk include tattooists, body piercers, sewage process workers, needle exchange service staff and those playing contact sports. Less obvious are civil engineers who may need to assess personal exposure risk in certain situations, such as when working in old sewers, as would anyone handling human sanitary waste.

118 The need for hepatitis B immunisation will be determined as part of the risk assessment described previously, and would only be considered following effective consideration of existing risks and any controls in place. Immunisation is considered a preventative measure in respect of the consequences following exposure and onward transmission, however Immunisation should not be relied upon as a primary control to prevent exposure. It is a useful supplementary control measure to reinforce procedural controls and the appropriate use of protective equipment. Of those given the vaccine, 10-15% will respond poorly (i.e. with low seroconversion) and may not be protected.

119 Health and Safety law requires that employees shall not be charged for vaccines offered as means of protecting them at work. In providing vaccines, employers should ensure that employees are made aware of the advantages and disadvantages of vaccination and its limitations. Generally the schedule for hepatitis B or combined hepatitis A and hepatitis B vaccine, consists of three doses, with or without a fourth dose. Occupational health records should be kept updated of any vaccination course(s) undertaken. Employees are at liberty to refuse vaccination, but any refusal should be considered as part of the risk assessment - since additional controls may be necessary - and considered with regards to the type of work assigned to the individual. Any exposure-prone work (Ref 42) should only be undertaken when all work activities and their potential for BBV exposure have been assessed in this way, and the necessary controls are in place.

120 Although HBV immunisation generally provides effective protection, those over the age of 40 are less likely to respond. Immunisation may take up to six months to confer adequate protection and antibody titres should be checked two to four months after completion. In non-responders, a repeat course of vaccine is recommended, followed by retesting one to four months after the second course. Those who still have a poor immune response, and who have no markers of current or past infection, will require specific hepatitis B immunoglobulin (HBIG) for protection, if exposed to the virus.

121 Those who respond well to the hepatitis B vaccine course do not require any further primary doses. They should receive a reinforcing dose five years after the primary course, unless they have already received a booster following possible exposure to the virus. Further information and general guidance on immunisation procedures is published and regularly updated by the Department of Health (Ref 43)

122 Under COSHH Regulations, individual workers have the right to know whether or not they have been protected by immunisation and employers need to know if the vaccine has been effective following administration. If not, other control measures are likely to be necessary. Consideration needs to be given to how the information on vaccination and seroconversion is relayed to management, whilst maintaining the medical confidentiality of the individual. In order to meet this requirement it would be necessary to obtain specific written consent from each employee so that the occupational health department can provide their deploying manager with information on whether they are considered to be immune/non-immune, and whether they require further immunisation reviews (e.g. booster dose of Hep B vaccine).

BBV stability and the importance of decontamination procedures

Virus survival in the environment

123 Experimental work with HIV and HBV has established the stability of these viruses under various conditions (Ref 44). These studies have demonstrated that, **'hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) can all survive outside the human body for periods up to several weeks. Viral survival is influenced by virus titre, volume of blood, ambient temperature, exposure to sunlight and humidity. HBV has the highest virus titre in untreated individuals and is viable for the most prolonged periods in needle syringes stored at room temperature.'**

124 Although the risk of transmitting infection is therefore reduced as the concentration of infectious virus drops over time, no assumptions about safety should be made when blood-soiled surfaces, equipment and clothing have not been decontaminated. The scale of any blood or body fluid contamination is important when considering how best to clean contaminated materials, and various approaches to cleaning, disinfection and sterilization are described below.

Methods of decontamination (cleaning, disinfection and sterilization)

125 Decontamination is a combination of processes that removes or destroys contamination so that infectious agents or other contaminants cannot reach a susceptible site in sufficient quantities to initiate infection or other harmful response. The processes may include:

Physical Cleaning

126 Cleaning is a process that physically removes contamination, including some microorganisms, and is required before effective disinfection or sterilization can be performed. Cleaning does not necessarily destroy all microorganisms, even if a surface looks cleaner, and the cleaning of equipment and work surfaces is best done using detergent and warm water. It's also important to ensure that the product you use will not damage your equipment and work surfaces.

Ultrasonication

127 Ultrasonication is a liquid-based method of cleaning recommended for some equipment, and is dependent upon cavitation (rapid formation and collapse of minute bubbles in a liquid). This method is appropriate for cleaning contaminated re-usable items that are fully submersible. Ultrasonication is performed in a lidded tank and can even clean apertures and recesses. Ultrasonic cleaners should be cleaned twice a day as a minimum requirement, and kept clean and dry overnight. Choice of cleaning agents should be recommended by the manufacturer and should reflect the planned use.

Heat - overview

128 Heat treatment is the most effective routine means of destroying the infectivity of all microorganisms, including BBV, and mainly involves the use of autoclaves (pressure steam sterilizers). Boiling and dry heat ovens do achieve raised temperatures that can kill microorganisms, but they may lack the required level of heat delivery and treatment control offered by steam sterilizers, and so are less reliable. There is also evidence that dry heat and boiling systems are seldom maintained or not subjected to periodic testing necessary to ensure that they are achieving sterilizing conditions consistently (Ref 45).

Autoclaving

129 Steam sterilization (i.e. autoclaving), is the preferred method of sterilizing equipment as it is quick, automated, easy to use, reliable, non-toxic and always effective when used correctly. It is particularly suitable for re-usable, heat-stable items, so long as these parts are already physically clean. All BBV are susceptible to standard autoclave treatments with pressurised steam, and large and small steam sterilizers are available, as is guidance on their use and maintenance (Ref 46).

Thermal washer disinfection

130 When autoclaving is impractical, small heat-stable items may be disinfected using hot water treatments. The MHRA Microbiology Advisory Committee to Department of Health no longer recommends simple immersion of items in boiling water as sufficient for sterilization (Ref 47). Thermal washer-disinfectors are acceptable and use a combination of physical cleaning and thermal biocidal action to achieve disinfection of contaminated, reusable items. This approach can either be used prior to reuse or to make items safe to handle before further reprocessing.

Dry heat

131 Dry heat sterilizers offer another method of sterilization, which is effective provided that the sterilizer has an automatic controller that will ensure that appropriate temperatures are achieved throughout the load. Temperatures must be maintained for the duration of the sterilizing time and required conditions are as follows:

160 to 170°C for 120 minutes, or

170 to 180°C for 60 minutes, or

180 to 190°C for 30 minutes

132 As well as the strict controls required for this method, dry heat sterilization time is long and additional time is required for the items to cool to room temperature prior to use. Items must be able to withstand at least 160°C for long periods. Further information on dry heat sterilizers and their use is available from MHRA (Ref 48).

Chemical disinfection – an overview

133 Some chemical disinfectants have been tested for their activity against BBV in the presence of whole blood or plasma (the fluid component of blood) in order to simulate in-use conditions. The protein in blood and other body fluids may confer a protective effect for the virus and in some cases may reduce the efficacy of chemical disinfectants. Effective testing of disinfectant can therefore be challenging, but it is reasonable to assume that – because of its robustness - any preparation effective against HBV will also be effective against other blood-borne viruses.

134 Disinfection of contaminated surfaces with bleach solution (minimum 1000ppm active chlorine) is known to be effective for the inactivation of BBV, but bleach is also susceptible to inactivation by organic soiling. Indeed, when disinfecting any soiled item this underlines the need for prior cleaning in order to reduce the organic load and thus promote adequate disinfection. This should not be done manually if operator safety is compromised, but may be achievable by alternative means in such cases, e.g. use of an ultrasonication tank, washer disinfector. Surface decontamination using liquid vacuum methods, e.g. of floor, carpets and upholstery surfaces, would be acceptable only if liquid disinfectant were present in the bulk cleaning fluid. The disinfectant would have to be compatible with the vacuum equipment, any co-added detergent and the treated materials themselves.

135 General advice on the appropriate use of cleaning agents and chemical disinfectants is given below in Info Box 3.5, with further information on laundry decontamination methods below and in Appendix 3.

Info Box 3.5: Common cleaning agents / disinfectants – and their appropriate uses

Cleaning agent / disinfectant	Instruments	Skin	Work surfaces
Powder or liquid detergent diluted in hot water as indicated by the manufacturer – this is a cleaning agent and not a disinfectant	Yes – can be used for initial cleaning of instruments prior to subsequent disinfection or steam sterilization	No – except for products approved as skin-safe	Effective for cleaning down surfaces at end of sessions/day, prior to surface disinfection
Bleach – hypochlorite - on application bleach products must contain minimum 1000ppm available chlorine, e.g. from: sodium hypochlorite solution or other source of chlorine such as sodium dichloroisocyanurate (NaDCC) soluble tablets	No	No	Yes (hard, man-made work surfaces). Corrosive - not for jewellery.

60-80% alcohol, available as a component of disinfectant spray or 60-70% alcohol wipes	No	Yes	Yes, but effect is greatly reduced by any soiling
Halogenated Tertiary Amines or Quaternary Ammonium Compounds (e.g. Trigene); these products may be available as spray, ready to use bulk solution, powder or wips	Yes – but some products may damage metal surfaces with lengthy exposure	No	Yes
Chlorhexidine based products – often combined with alcohol, e.g. Hibisol. Sachets should be packed individually to prevent contamination	No	Yes	No
Glutaraldehyde-based products such as Omnicide™	This substance cannot be used on skin and is both an irritant and a potent allergen. Exposure to it is strictly controlled under COSHH. Its use cannot be recommended unless appropriate exposure control measures are in place.		
****Phenolic-**based products such as Hycolin, and related products such as Stericol and Clearsol	These products contain 2,4,6-trichlorophenol and/or xylenol, and these chemicals were not supported under a recent biocides review. As such these products can no longer be supplied for any application, and were never appropriate for use on skin		

****Information source: http://www.hse.gov.uk/biosafety/notices/biosn012007.htm

136 Additional free information on chemicals and their safe use under COSHH can be found at: http://www.hse.gov.uk/coshh/

Procedures for chemical disinfection

137 As is evident from Info Box 3.5, all chemical disinfectants have their limitations and appropriate uses, and reliable inactivation of infectivity is difficult to achieve under some conditions. The presence of blood, body fluids and other organic matter can markedly reduce their action.

138 All disinfectants are potentially hazardous and must be stored and used with caution; hypochlorite for example, corrodes metals, irritates skin and bleaches fabrics and clothing. An assessment of products in use should form part of the assessment of risk from hazardous substances required under COSHH.

139 Key points to consider in the use of disinfectants are:

- The supplier should be asked to provide evidence of the product's efficacy against BBV and the user must be satisfied with its efficacy under the proposed conditions of use;
- Disinfectants must be used at the concentration recommended for the purpose by the supplier;
- If compatible with operator safety, cleaning of the surface / item should take place before a disinfectant is used;
- Only freshly prepared dilutions should be used as many disinfectants begin to lose their efficacy when mixed with water and left to stand;
- A disinfectant will be effective only if the recommended contact time is allowed for it to act; and,

- The presence of other chemicals may reduce the effect of disinfectants and/or react violently with them presenting a hazard to those in the vicinity e.g. acids or acidic fluids such as urine, with hypochlorite preparations (eg household bleach) generate chlorine gas.

140 Levels of contamination may vary, and this will influence the degree of cleaning and disinfectant required for different application. In particular, visible blood or body fluid will require use of a higher concentration of any chosen product, and the end user should be aware that higher concentrations of some disinfectants might produce bleaching or staining effects on treated materials. A wide choice of virucidal products is, however, now available, and material damage should be avoidable without compromising treatment efficacy.

Laundering at high and low temperatures

141 The process of laundering contaminated linen (including clothing) requires treatment that is effectively a wash-based disinfection process, and is required to avoid cross infection from re-used items. Contaminated linen is generated by hospitals, care homes, nursing homes and similar facilities, as well as in the home care setting; anywhere that care of the sick and infirm is undertaken (Ref 49 & 50). The nature of laundry soiling depends on the source, and at the most extreme levels e.g. in hospital and nursing home environments, is likely to include blood, wound exudates, sputum, saliva, sweat and urine, as well as vomit and faeces. It is also important to recognise that blood-stained bodily wastes such as urine may also serve as a potential source of infection. The nature of the soiling will determine how contaminated items are sorted and processed, and current UK categorisation recommends sorting in to Used Linen (soiled and foul), Infected Linen and Heat Labile Linen. Infected Linen is defined as linen derived from known infectious patients, including those with HIV, hepatitis B, C and other infectious agents. Linen can be made safe by washing to remove any contaminating body fluids, but it is often not practical to wash domestic linen at high temperatures because of the heat lability of fabrics. Recommended wash conditions, based on the levels of soiling, are as follows:

Current recommended treatments to ensure cleaning and disinfection of Used (soiled and foul) Linen:

- A 65^{o}C temperature hold for a minimum of 10 mins within the wash cycle; or
- Preferably 71^{o}C for not less than 3 mins.

142 Mixing time must be allowed to ensure heat penetration and assured disinfection. A sluice cycle must be added in to the cycle when dealing with foul linen.

Recommended treatment to ensure disinfection of Infected Linen:

143 Mainly applicable to the health care setting

- Linen in this category should not be sorted, other than in to a red, water-soluble bag – this then placed in an outer polyester or nylon carriage bag;

- Inner bag removed from the outer bag only at the point of transfer to the washer-extractor, followed by the outer bag;
- Storage of infected linen must be done in a secured area, prior to washing;

144 The same wash temperature profile as used for Used (soiled and foul) Linen is thought sufficient to inactivate HIV, but the evidence is less certain for hepatitis B. The wash temperature, coupled with the dilution factor, should render linen safe to handle on cycle completion.

Current recommended treatment to ensure disinfection of Heat Labile Linen:

- These items need to be washed at ~40^{o}C, so the wash temperature is insufficient to disinfect, and chemical alternatives are required;
- Addition of hypochlorite may be possible, but efficacy may be reduced by the presence of soiling, detergents and alkalis in the main wash;
- Disinfection with hypochlorite is only reliable if the linen can tolerate its addition and if sodium hypochlorite is added during the penultimate rinse of the cycle;

145 A final concentration of 150ppm available chlorine must be achieved for a minimum of 5 minutes exposure time.

Laundering contaminated items in the community setting

146 Existing guidance (Ref 51) states that:

147 In the community setting or elsewhere without access to specialist services, contaminated clothing or linen should be treated in one of the following ways:

- *Washed with detergent using the hot wash cycle of a domestic washing machine to a temperature of at least 80^{0}C; or
- Dry cleaned at elevated temperatures, or dry cleaned cold followed by steam pressing; or
- Incinerated if items cannot be effectively washed as described above

*Machine overloading should be avoided. If washing by hand is unavoidable, household rubber gloves **must** be worn

148 Recommendations for work ware laundering are also available from the Department of Health (Ref 52)

149 Further occupational and patient laundry information is given in Appendix 3.

Chemical disinfection of blood or body fluid spillage

150 Blood and body fluids may contain a high concentration of microorganisms from known BBV-infected individuals. If spills are large, e.g. from deep cuts, they are a source of potential infection for others who may come in to contact with the spill. All spills should therefore be made safe as soon as possible after the spillage is discovered. Because clearing blood or body fluid spillages may expose an individual to infectious microorganisms, every care must be taken to ensure the

member of staff is protected by the appropriate use of protective clothing. Local codes of practice should specify procedures (e.g. spill kits) and the disinfectants to be used for dealing with spillage and other forms of contamination.

151 The following points apply, regardless of the scale of the spill:

- Gloves should be worn throughout and should be discarded safely after use; and
- If there is broken glass present, it is essential that the fragments are not gathered up by hand either before or after treatment with disinfectant. Bunches of paper towels or newspaper, pieces of card or a plastic dustpan should be used to remove the fragments to a sharps container without risk of sharps injury.

Procedure for small spots of blood or small spills

- Gloves should be worn and lesions on exposed skin covered with waterproof dressings;
- Contamination should be wiped up with a paper towel soaked in freshly prepared hypochlorite solution containing 10,000ppm available chlorine; and
- Towels and gloves should be placed in a clinical waste bag for incineration and hands washed.

Procedure for larger spills other than urine (unless bloodstained)

- Gloves should be worn and lesions on exposed skin covered with waterproof dressings;
- If the spillage is extensive, disposable plastic overshoes or rubber boots may be necessary;
- If splashing is likely to occur while cleaning up, other protective clothing should be worn (see above);
- Liquid spills should be covered with dichloroisocyanurate granules and left for at least two minutes before clearing up with paper towels and/or a plastic dustpan;
- Alternatively, the spill may be covered with paper towels and the contaminated area gently flooded with hypochlorite solution containing 10,000ppm available chlorine* (again this should be left for at least two minutes before attempting to clear up);
- Towels, gloves, disposable overshoes and contaminated clothing should be placed in a waste bag for incineration and hands washed; (rubber boots may be decontaminated with dilute disinfectant);
- Finally, the area should be washed with water and detergent and allowed to dry;
- *Note that urine may promote the release of free chlorine from the treated area when hypochlorite or other chlorine-containing compounds are applied. Ventilation of the area will be necessary; and
- In open areas, for example playgrounds and roadways etc, the spillage should be hosed down with large amounts of water.

Carpet and upholstery spills

152 In an environment where there are likely to be blood or body fluid spills, carpets and soft furnishings should be avoided, as they will be damaged by most chemical disinfectants suitable for routine use. Washable chair covers should be considered if necessary. Within the domestic environment it is, however, unlikely that such measures will be in place. Sensible options must therefore exist for cleaning and disinfecting soft furnishings following spillage of body fluids.

153 If contamination does occur, e.g. of carpets or other fixed cover textiles, detergent cleaning should be followed by steam cleaning, so long as the materials will tolerate this. For curtains and other loose cover items, laundering or dry-cleaning followed by hot pressing is effective. Again, textiles should be checked to ensure their tolerance of such treatments. It should, however, be noted that the efficacy of such procedures is likely to be variable, and dependent on choice of (steaming) equipment, disinfectants and nature of the textile being treated.

154 If unable to disinfect as suggested, it will be necessary to incinerate soft furnishings if the contamination level is heavy and if there are grounds for believing that the contaminating material is infectious.

Do you need further information?

Here are some principles of risk assessment in more detail

1. Identify the Hazards

- Is there possible contact with human blood and/or body fluids in your workplace? If yes….

2. Decide who might be harmed and how

- Who could come into contact with human blood and/or body fluids? Including:
    - Regular staff
    - Cleaners
    - Engineers, maintenance/service workers
    - Visiting workers and students
    - Members of the public, including visitors
- Where could contact occur?
- In what ways could they be exposed to human blood and/or body fluids? Examples may include:
    - Direct personal exposure during invasive procedures
    - Dealing with accidents and emergencies
    - Handling items such as contaminated instruments, tools and equipment for cleaning, repair or disposal
    - Handling contaminated waste
- Routes of exposure may be via:
    - Percutaneous or penetrating injury
    - Skin abrasions, cuts
    - Contact with spillages

- Deposits on contaminated clothing

3. Evaluate the risks and decide on precautions

The risk of any BBV infection is low for the majority of occupations. To assess the extent of the risk consider:

- The frequency and scale of contact with blood (daily/occasional/rarely);
- Whether or not the blood is likely to come from infected individuals;
- The type of exposure, for example, employees involved regularly in invasive procedures such as any use of instruments, needles etc to penetrate the body are at greater risk of accidental inoculation or other forms of contamination;
- The number of different persons' blood with which contact is made;
- The prevalence of infection in the community.

Following this evaluation, consider:

- The quality/adequacy of existing control measures, which may include;
  - Specific work equipment,
  - Working barrier procedures
  - Personal protective equipment (PPE)

- Making improvements to existing control measures, with priority for action.

4. Record your findings and implement them

If you have five or more employees you must record your findings from the above including:

- The control measures you have selected
- Any action you identified to reduce risk of exposure further.

It is also advisable to include for audit purposes:

- Who is responsible for carrying out any further actions
- A timescale for doing so.

5. Review your assessment and update if necessary

Assessments should be reviewed:

- On a regular, scheduled, basis
- Ahead of schedule if the nature of the work changes
- Ahead of schedule if something suggests the original assessment is no longer valid, e.g., as a result of an incident.

6. To make your assessment 'suitable and sufficient', you should:

- Reflect the nature of the work activity being assessed; the more hazardous the scenario, the more in-depth the assessment required. For example
  - A risk assessment for someone deliberating working with blood containing known BBVs at high titre would be far more detailed than an activity where there is potential for incidental exposure to pre-screened blood;

- Draw on specialist advice where required and proportionate to the risk. For example:

- An NHS trust would be expected to consult with their dedicated infection control team when assessing the risk from using sharps/needles

…whereas….

- A small Hairdressing Salon assessing the potential risks from BBVs may obtain sufficient specialist advice from, for example, NHS Direct or their Local General Practitioner.

- Consider all those who may be affected by the work (including those other than employees);
- Anticipate the foreseeable risks
- Include a suggested date for review, or otherwise identify how long the assessment is likely to remain valid.

Further advice on the principles and stages of risk assessment are available from the HSE web site at: http://www.hse.gov.uk/pubns/indg163.pdf

Part 4: Guidance on management of incidents potentially involving exposure to a blood-borne virus

Overview

155 This section of the guidance is intended to provide broadly applicable advice to assist in the initial management of a potential exposure to a blood-borne virus, irrespective of the circumstances or the location of that exposure. Further management of such an incident will require specialist knowledge and expertise. This is available through a number of sources such as:

- Specialist led Occupational Health Departments
- Virology/Microbiology Department
- Infectious diseases specialist
- Genito-Urinary medicine specialist
- Accident and Emergency Departments

156 In this section, the term ‘source’ means the person from whom the blood or bodily fluid originates, whilst the term ‘recipient’ means the person exposed to potentially BBV infected blood or body fluids.

157 Exposure to blood-borne viruses may arise through a wide variety of different circumstances. Occupational exposure is most likely to occur in the context of health-care, whereby workers are exposed to the blood or bodily fluids of BBV-infected patients. However, exposure may also occur in any workplace where one individual is exposed to the blood or other bodily fluids of any other individual, e.g. following an accident. Such exposures may also occur in the home or through participation in leisure pursuits.

158 It is not the intention of this section of the guidance to reproduce or replace the extensive and detailed existing guidelines relating to post-exposure management as these are available from a variety of sources to those health-care professionals. Relevant information sources are listed in Info Box 4.1 below. Rather, this section of the guidance is aimed at helping those involved in the initial management of the incident, to determine whether onward referral to such professional advice is necessary.

Immediate first aid requirements

159 Where the eyes or mouth have been exposed to blood or body fluids, they should be washed copiously with water. For puncture wounds, the wound should be gently encouraged to bleed, but not scrubbed or sucked, and should be washed with soap and water. It is NOT necessary to keep any needle/sharp instrument to send to the laboratory for testing for the presence of blood-borne viruses. Any such sharp instruments should not be re-sheathed, but be disposed of directly into an appropriate container.

160 An urgent risk assessment is required to establish if the exposure has the potential to transmit a blood-borne virus – i.e. whether or not the exposure is significant. A number of factors will be taken into account in the risk assessment, including:

- **Type of body fluid to which the recipient has been exposed** - Blood carries the highest risk, but BBV can be transmitted by other bodily fluids (see Introduction to this guidance), especially if they are also contaminated by blood.

- **Route of exposure** - This is classified essentially into 3 categories – percutaneous, mucous membranes (which include eyes, mouth), and skin. Splashing of blood/bodily fluids onto mucous membranes may result in virus transmission, although the risk is considerably lower than for percutaneous exposure.
    - If intact, skin is impervious to these 3 viruses; however,
    - If the skin is NOT intact e.g. through cuts or abrasions, or chronic dermatitis such as eczema, then transmission may occur

- **Nature of exposure** – An assessment should be made as to whether exposure to blood/bodily fluids was direct, or indirect, e.g. through a contaminated device or instrument:
    - If indirect, then in what way had it become contaminated? Contaminated hollow bore needles (e.g. those used for injection) are more likely to transmit than solid needles (e.g. those used in suturing);
    - Needles that have been present in a blood vessel are more likely to transmit than needles used for intramuscular injection;
    - How soon after the sharps became contaminated did the exposure incident occur? The viability of the BBVs will decrease rapidly on drying, so for instance transmission is very unlikely from a dried-up needle found lying in a field;

- **Personal protective equipment** (PPE) used – e.g. were gloves in use? There is a wiping effect as a needle pierces a glove, which may reduce the likelihood of transmission

- What is known about the source?
    - If the source is known, then their status with regard to BBV infection or the presence of risk factors for BBV infection, may be ascertained;
    - If the incident arose from an unknown source, a risk assessment may still be possible in the light of local knowledge of the prevalence of BBV infections.

- **Hepatitis B immunisation status of the recipient** – has the recipient previously received any doses of HBV vaccine? If so, was he/she a responder to the vaccine?

161 All of the above will contribute to decisions on whether HIV and/or HBV post-exposure prophylaxis (PEP), or follow-up for evidence of HCV transmission, is required.

Grading of risk

162 Taking into account the above factors, it should be possible to categorise the incident into one of three broad categories.

Very low risk. This would include e.g. blood or bodily fluid on intact skin, or exposure to bodily fluids not regarded as vehicles of transmission (see Info Box in Introduction to this guidance). The area should be washed thoroughly, but gently, with soap and running water, without scrubbing. No further action is necessary.

Low risk. This would include e.g. a percutaneous injury from a dried-up abandoned needle in a public place, or mucous membrane splash from an individual not at high risk of being a BBV carrier.

High risk. This would include e.g. a percutaneous injury or skin/mucous membrane exposure to blood/bodily fluids from a source with significant risk factors for a BBV infection.

163 Management of incidents in the latter two categories will include some or all of the following:

- Obtaining a blood sample (5ml clotted) from the recipient to be sent to the laboratory as a baseline sample for storage. This will only be tested, with informed consent, at a later date if subsequent follow-up tests of the recipient prove to be positive for a BBV infection;
- Starting an accelerated course of hepatitis B vaccination, if not previously immunised or if a hepatitis booster is due;
- Consideration of the need to administer an immediate dose of hepatitis B immunoglobulin;
- Consideration of the need for follow-up testing for hepatitis C virus infection. If this is deemed necessary, the recommended schedule for testing is for HCV RNA at 6 weeks, HCV RNA and anti-HCV at 12 weeks, and anti-HCV at 24 weeks;
- Consideration of the need for immediate post-exposure HIV prophylaxis;
- Arrangement of suitable follow-up appointments for administration of further doses of HBV vaccine, monitoring of anti-retroviral therapy, and taking of appropriate blood samples for testing.

The source individual

164 Where appropriate, the individual who is the source of the blood/body fluid should be approached, given an explanation of the incident and asked for informed consent for them to be tested for HIV, HBV and hepatitis C (HCV), where the status is not already known. Such information will clearly impact on any decisions taken with regard to the management of the recipient. This universal approach to source testing for BBVs normalises the procedure and avoids perceived discrimination [EAGA HIV PEP Guidelines 2004 (Ref 53)].

Management strategies for blood-borne viruses

165 For each of the three main blood-borne viruses, there are possible post-exposure interventions and management strategies designed to minimise the

chances of the recipient of that exposure from acquiring a blood-borne virus infection as a result of the exposure. In brief, these possibilities are as follows (also summarised in table 4.1):

Hepatitis B Virus: Following exposure to HBV – consideration of passive immunisation (i.e. administration of preformed antibodies against HBV derived from healthy blood donors) in the form of hepatitis B immunoglobulin (HBIg), and of active immunisation with hepatitis B vaccine, usually using an accelerated course (i.e. doses administered 0, 1, 2, and 12 months post-exposure).

Hepatitis C Virus: Following exposure to HCV – strict monitoring of the recipient over six months for evidence of acquisition of infection with HCV, and should that occur, consideration of antiviral therapy, as evidence shows that treatment at this stage is very successful.

Human Immunodeficiency Virus: following exposure to HIV – administration of post-exposure prophylaxis (i.e. a regimen of 3 anti-HIV drugs taken for 4 weeks post exposure).

Table 4.1

Virus	Risk*	Intervention
HBV	up to 30%**	Post-exposure prophylaxis with vaccine and/or HBIg
HCV	1-3%	Monitor recipient. Early therapy if transmission occurs
HIV	0.3%	Post-exposure prophylaxis – anti-retroviral drugs

* Risk of transmission following needlestick exposure
** In unvaccinated individuals

166 The interventions above can only be instituted after careful risk assessment of the exposure incident by appropriately trained medical personnel. In the first instance, exposed individuals may seek immediate advice from their occupational health provider or from primary care facilities (General Practitioners). It is important, however, that those affected are then promptly referred on for specialist post-exposure care at a recognised specialist centre. This phase of treatment or observation is most likely to be administered by a local accident and emergency department, or by other specialist personnel at the local hospital. For those working outside of the NHS, occupational health facilities and expertise will vary in different occupational settings. It would therefore be recommended that all occupational health providers ensure that local arrangements are in place to assist those affected by an exposure incident; in particular to ensure that the correct BBV medical support is accessed with minimal delay.

Info Box 4.1: Authoritative information sources related to BBV post exposure intervention and treatment

- The 2004 version of the guidelines: HIV Post-Exposure Prophylaxis: Guidance from the UK Chief Medical Officers' Expert Advisory Group on

AIDS. Department of Health, February 2004. www.dh.gov.uk/assetRoot/04/08/36/40/04083640.pdf

- National guidance is available to aid the management of healthcare workers exposed to a hepatitis B infected source patient, including the use of hepatitis B vaccine and immunoglobulin. This is available from Immunisation against infectious disease, Hepatitis B, Chapter 18, The Green Book. London: Department of Health, December 2006. This document is available at: www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/Greenbook/DH_4097254

- Full details on the required follow-up for healthcare workers exposed to hepatitis C can found in the following publication: Guidance on the investigation and management of occupational exposure to Hepatitis C, ME Ramsay. Communicable Disease Public Health 1999; 2: 258-62. Available at: www.hpa.org.uk/cdph/issues/CDPHVol2/no4/guides_hepC.pdf

Incident reporting

Mandatory Scheme for Reporting Exposures

167 Occupational exposures to blood borne viruses, (hepatitis B, hepatitis C and HIV), are reportable to the Health and Safety Executive under The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) as a:

- Dangerous occurrence – as the exposure would qualify as an 'accidental release of a biological agent likely to cause severe human illness';
- Over-three-day injuries – if exposure to the blood borne virus resulted in the worker being absent from work for three or more days;
- Diseases – if exposure to the blood borne virus resulted in the worker acquiring the virus.

168 Further details relating to RIDDOR and how to report are available at: www.hse.gov.uk/riddor

169 The Health and Safety Executive's Infoline is available for advice, telephone: 08701 545500

Voluntary Scheme for Reporting Exposures

170 Health Protection Agency Centre for Infections – Surveillance of Significant Occupational Exposures to Blood borne Viruses in Healthcare Workers

171 The Health Protection Agency receives reports on:

- Significant percutaneous or mucocutaneous exposures to blood or other body fluids from a source that is known to be, or as a result of the incident found to be, hepatitis B surface antigen (HBsAg), hepatitis C, or HIV positive.

- Significant percutaneous or mucocutaneous exposures to blood or other body fluids from a source patient considered to be of high risk of HIV, but the viral status is unknown and the worker has commenced HIV PEP.

172 Further details on the surveillance scheme are available at: http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1191942146589

173 Alternatively, please contact the Health Protection Agency Centre for Infections, HIV/STI Department, 61 Colindale Avenue, London NW9 5EQ; telephone 020 8327 7095/7152.

Appendix 1 - Use of gloves

1 Within the hierarchy of controls recommended by COSHH (2002), elimination and engineering controls should have priority over the use of personal protective equipment, including the use of gloves. However, where it is not possible to achieve adequate control by other means alone, personal protective equipment including gloves should be used in combination and addition to other controls. In practical terms, gloves will play an important part in protecting workers from exposure to blood borne viruses, especially where there is a risk of injury such as a puncture wound with contaminated sharps, or abrasions or cuts. It is likely to be in the laboratory and healthcare sectors where staff are at greatest risk of exposure. Also, the Advisory Committee on Dangerous Pathogens (ACDP) guidance 'The management, design and operation of microbiological containment laboratories' (HSE, 2001) recommends that **"gloves should be worn for all work with material known or suspected of containing hazard group 3 biological agents" and that "a supply of suitable disposable gloves in various sizes and materials should be available in the laboratory".**

2 The main considerations are:

- **What gloves to wear** – appropriate to the work being done and the materials being handled, and
- **How to remove gloves safely** – to prevent potential cross-contamination.

What gloves to wear

3 The gloves worn should be able to provide protection from exposure to blood borne viruses for the duration of the tasks being undertaken. This may mean having to change them safely mid task if they become damaged and/or having to wear a combination of more than one type of glove to provide additional physical protection. For example:

- General hospital work or work in a laboratory is likely only to require disposable medical gloves (also known as medical examination gloves, exam gloves and surgical gloves). In certain circumstances, double gloving may be required to provide additional protection. This allows for removal and replacement of the outer gloves, if contaminated, while still retaining skin protection.
- For some surgical work, e.g., orthopaedic or dentistry where additional physical protection may be needed, double gloving, the use of glove liners or of knitted or steel weave outer gloves may be appropriate and are proven to be beneficial (Tanner & Parkinson, 2002).
- For some work, such as post mortem or embalming, where there is a risk of exposure to blood borne viruses as well as the requirement to use knives, saws etc., pierce and cut resistant gloves are likely to be needed in addition to those providing microbiological protection.

4 When choosing protective gloves, look for the following information: European Standards for personal protective equipment (PPE) demonstrate their conformity

with the basic health and safety requirements of the EC Personal Protective Equipment Directive. Only equipment meeting these requirements is entitled to carry a CE mark and be sold for use in the EC.

- **EN 420:2003** - General requirements for gloves, supplemented by (as appropriate):
- **EN 388:2003** - Protective gloves against mechanical risks (abrasion resistance, blade cut resistance, tear resistance, puncture resistance);
- **EN 1082-1:1997**- Protective clothing - Gloves and arm guards protecting against cuts and stabs by hand knives: Chain mail gloves and arm guards;
- **EN 374-1:2003** - Protective gloves against chemicals and microorganisms. As for EN 420 and EN 388, plus gloves resisting microorganisms must achieve performance level 2 in penetration. Although this cannot infer protection against virus because they are not used in the performance tests, in practical terms this is the highest level of protection afforded against microorganisms.

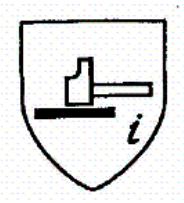
5 It is important to look for the above information on glove packs. Some disposable gloves, such as transparent polythene gloves, which may be in use in your workplace, are loose fitting and easily perforated. They will not conform to the above standards, especially for tear resistance and are not fit for the purpose of protection against exposure to blood borne viruses.

6 Latex allergies are becoming common with prolonged use of latex gloves, and the use of nitrile or vinyl gloves is recommended to avoid becoming sensitised. It is recognized, however, that within certain work environments, latex gloves are still used in large numbers due to their efficacy and relatively low cost. If latex gloves are worn, then powder free, low protein content materials should be chosen to help prevent latex allergy. Powdered gloves should be avoided as they can increase skin irritation and the likelihood of allergy development.

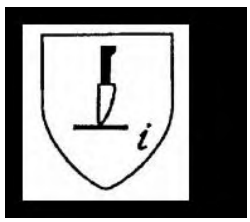
7 Further information on latex allergy can be found on-line at: http://www.hse.gov.uk/latex/about.htm and detailed information on skin care and dermatitis in the work place can be found at: http://www.hse.gov.uk/skin/

Symbols to look for on glove packs:

Mechanical hazards

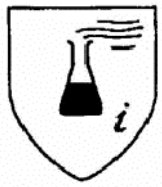


Impact cut



Chemical hazards

Micro-organism hazards



How to remove gloves safely

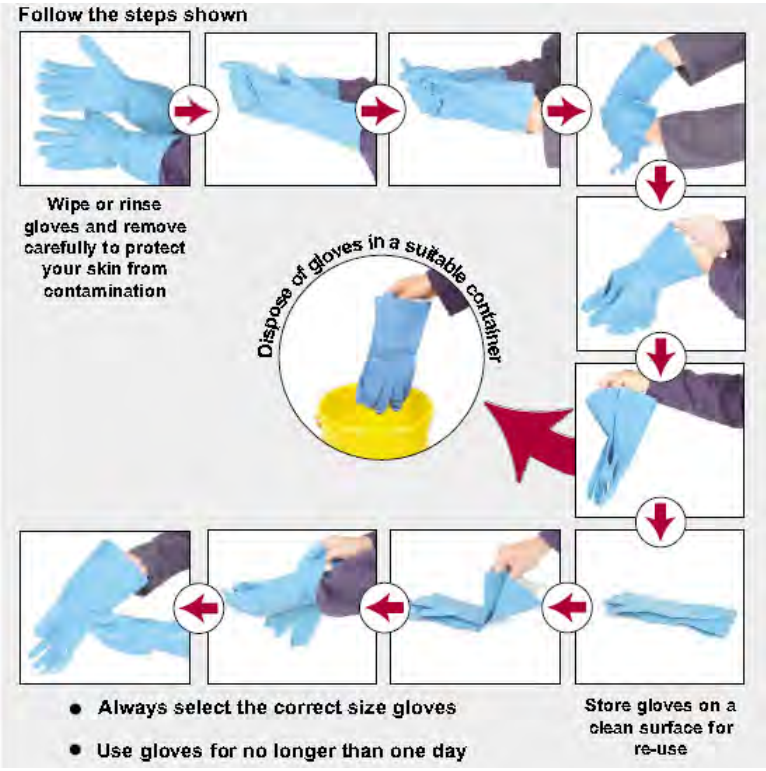
8 When removing potentially contaminated gloves it is important to ensure that you do not transfer the contaminant onto your skin. The following pictorial guides show proven methods for correct removal of gloves to minimise the risk of cross-contamination. They are available to download as posters to put up in your workplace from:

http://www.hse.gov.uk/skin/posters/singleusegloves.pdf and
http://www.hse.gov.uk/skin/posters/reusablegloves.pdf.

9 It is important to use one glove to remove the other. With disposable gloves it is best to turn them inside out as they are removed.

10 UV light fluorescent dyes are available as a training aid. To use these, contaminate the outside of gloves with the dye, remove the gloves then examine your hands under a UV light source to check for cross-contamination. To find these products put 'fluorescent hand hygiene training' in a web search engine.

Procedure for correct removal, storage and putting on of re-usable gloves:



Procedure for correct removal and disposal of single use gloves:

A final word on hand hygiene hand disposable glove use

11 Aspects of hand washing is covered elsewhere within this guidance (see Part 3), but it is important to remember that glove use is not a replacement for good hand hygiene, and the two should work together to protect the wearer and, for example, any other party, such as a patient or client being treated. Key requirements are:

- When using disposable type gloves, your hands should be washed and dried thoroughly before putting the gloves on;
- Where client or patient treatments are involved, a fresh pair of disposable examination-style gloves must be worn for each procedure and must be disposed of between procedures to avoid cross-infection. Never wash and re-use disposable gloves;
- If you need to temporarily stop work, e.g. to answer a phone, always remove and discard the gloves you are wearing and replace them when you continue working;
- Always wash your hands after glove removal - gloves are **not** a replacement for hand washing; and,
- Moisturising hand cream, applied after hand washing, can help prevent skin drying after frequent washing. Such products should never be relied upon as a physical barrier to protect the skin from infection.

Appendix 2 – Transport of infectious substances

1 This appendix provides an overview of the transport requirements for materials containing or contaminated with blood borne viruses. For specific and detailed information, readers are directed to other relevant publications. In particular, the Department for Transport sets out the legal requirements and provides specific detailed guidance on the classification, packaging, labelling and transport of infectious substances, in their publication **'Transport of Infectious Substances'**, which can be downloaded from their website:

- **'Transport of Infectious Substances'**, A guidance document produced by the Department for Transport, the Civil Aviation Authority and the Maritime and Coastguard Agency' available from DfT website http://www.dft.gov.uk/pgr/freight/dgt1/publications/otherpublications/

2 In the context of this guidance, the most likely materials presenting a risk of infection from blood borne viruses, which will be subject to transport include:

- Patient specimens/samples;
- Cultures of blood borne viruses;
- Waste from spillage/treatment of workers;

3 In respect of the laboratory and healthcare related transport of infectious substances detailed guidance is provided elsewhere, in particular:

- **'Biological Agents: Managing the Risks in laboratories and healthcare premises'**, Appendix 1.2 Transport of Infectious Substances, available from HSE website at http://www.hse.gov.uk/biosafety/biologagents.pdf
- **'Transport of infectious substances - best practice guidance for microbiology laboratories'**, available from the Department of Health website at http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_075439

Legislation

4 The GB regulations covering the carriage of dangerous goods by road and rail are derived from European Directives (ADR (road) and RID (rail)), which in turn implement international modal agreements governing the transport of dangerous goods. The GB regulations directly reference ADR in relation to the classification, packaging and labelling of all classes of dangerous goods, including infectious substances, and are updated every two years.

5 The requirements for air transport of dangerous goods, both within Great Britain and overseas, are contained in the International Civil Aviation Organisation (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air. They are essentially similar to those for road and rail as they mirror the same international modal agreements, but there are some minor differences (highlighted in the following text).

6 Biological agents, or materials that contain or may contain them, are allocated to UN Division 6.2 - infectious substances. Division 6.2 includes biological products, cultures, specimens, genetically modified micro-organisms (GMMs) and genetically modified organisms (GMOs) and medical/clinical waste.

Transport of infectious material

7 There are 4 steps involved in the safe transport of infectious material. These are:

- Classification;
- Packaging;
- Labelling; and
- Transporting.

Classification

8 Infectious substances are divided into the following categories:

- **Category A**: an infectious substance which is carried in a form that, when exposure to it occurs, is capable of causing permanent disability, life threatening or fatal disease in otherwise healthy humans or animals. This definition is supplemented by an indicative list of pathogens, which includes HIV and Hepatitis B viruses (but not Hepatitis C virus), when in the form of cultures but does not encompass specimens from patients suspected of having these infections.
- **Category B:** any infectious substance that does not meet the criteria for inclusion in Category A. These are assigned to UN 3373. This would include specimens from patients with known or suspected HIV, HBV or HCV infections.

9 Samples of materials such as blood, tissue, excreta, secreta etc collected from humans or animals are considered, as a minimum, Category B infectious substances. Clinical or medical waste that contains Category B infectious substances (with the exception of cultures) or that only has a low probability of containing infectious substances is assigned to UN 3291.

Packaging

10 Transport of infectious substances requires a basic triple packaging system. It consists of three layers as follows.

- Primary receptacle. A primary watertight leak-proof receptacle containing the specimen. The receptacle is packaged with enough absorbent material to absorb all fluid in case of breakage.
- Secondary packaging. A second durable, watertight, leak-proof packaging to enclose and protect the primary receptacle(s). Several cushioned primary receptacles may be placed in one secondary packaging, but sufficient additional absorbent material shall be used to absorb all fluid in case of breakage.

- Outer packaging. Secondary packaging are placed in outer shipping packaging with suitable cushioning material Outer packaging protect their contents from outside influences, such as physical damage, while in transit.

11 Each completed package is normally required to be marked, labelled and accompanied with appropriate shipping documents (as applicable). Specific details on the packaging requirements and specifications are available from the department for Transport.

Labelling

12 Packages containing infectious substances should be marked with:

- the proper shipping name, e.g. 'Infectious substance, affecting humans';
- with the appropriate UN number (e.g. for 'Infectious substances, affecting humans' this would be UN 2814); and
- the appropriate warning label.

Transport

13 In general, Category B samples that are sent using UN 3373 can normally be sent via the postal service. However, as a proportion of the post in the UK will travel by air at some point in its journey, the packaging will need to comply with the ICAO standards. Similarly, some courier companies will accept only Category B infectious samples, hence it may be necessary to use a different company for Category A infectious samples. You should always discuss your transport requirements with your chosen Carrier.

14 Further information on transport of infectious substances can be obtained from the Department for Transport (http://www.dft.gov.uk/contact) Telephone Enquiries line Tel. 02079448300).

Appendix 3 – Sector-specific practical guidance

Disclaimer: This Appendix provides an overview and relevant links to Blood Borne Virus-related guidance, covering a variety of work place activities. An active approach has been taken within this document to develop links to other specialist sites that serve specific work sectors. In selecting these sites, every effort has been made to ensure that their content is relevant, up to date and useful. However, the ACDP is not responsible for the accuracy of material on linked sites and does not necessarily endorse the views expressed within them. We cannot guarantee that links to external sites will remain active indefinitely, and there may be occasions when searches must be performed to relocate hyperlinked documents that have been moved or amended by their publishers.

General guidance on BBV in the workplace is available from:

Blood-borne viruses in the workplace: Guidance for employers and employees. ISBN 0 7176 2062 X. Single free copies are also available from HSE Books and a web version can be found at: www.hse.gov.uk/pubns/indg342.pdf

In addition to the above, a listing of both generalised and specific guidance information exists, with most entries relating to laboratory and healthcare work, and these can be found collectively at: http://www.hse.gov.uk/biosafety/information.htm

1 Laboratories:

The general principles of hygiene controls, hazard awareness, microbiological containment and risk assessment for lab work are now well described in the ACDP **document Biological agents: Managing the risks in laboratories and health care premises (2005), and also within the HSAC document Safe working and the prevention of infection in clinical laboratories and similar facilities (2003).** Links to these documents are provided below, however, their content covers all biological agents, not just BBV, and as such their advice is more generalised. The above documents do, however, refer to details of work notification, general lab precautions, intentional propagation and concentration of BBVs and their containment. The HSAC guidance also provides information re: the exact nature of materials that may contain BBV, and such information is available elsewhere, e.g. **The UK Health Departments Guidance for Clinical Health Care Workers: Protection against infection with blood-borne viruses: Recommendations of the expert advisory group on Aids and the Advisory Group on Hepatitis** (see below).

Relevant guidance for overlapping or specialist laboratory work areas:

a. Microbiological (including Virology)

Advisory Committee on Dangerous Pathogens. (2005). Biological agents: Managing the risks in laboratories and health care premises. Available for download at: http://www.hse.gov.uk/biosafety/information.htm

Advisory Committee on Dangerous Pathogens. (2001). The management, design and operation of microbiological containment laboratories. ISBN 0717620344. From HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: 01787 881165.

HSE - Health Services Advisory Committee (2003). Safe working and the prevention of infection in clinical laboratories and similar facilities. ISBN 0717625133. From HSE Books.

b. Pathology, cell culture and cytogenetics

Dept. of Health (2001). Revised advice on laboratory containment measures for work with tissue samples in clinical cytogenetics laboratories supplement to: ACDP guidance on protection against blood-borne infections in the workplace HIV and hepatitis. Product number 24396. From DH Publications, DH Publications Order line, PO Box 777, London SE1 6XH, Tel: 0870 155 54 55

c. Primate work

Advisory Committee on Dangerous Pathogens. (1998). Working safely **with** simians: management of infection risks. Available for download at: http://www.hse.gov.uk/biosafety/information.htm

2 Healthcare and related:

The Department of Health, Health Protection Agency and Health and Safety Executive publish and maintain many guidance documents related to BBV and the health care sector. For general infection control information, the following sources of information are available:

Expert Advisory Group on AIDS and the Advisory Group on Hepatitis (1998). Guidance for clinical health care workers: protection against infection with blood-borne viruses: Recommendations of the Expert Advisory Group on AIDS and the Advisory Group on Hepatitis. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4002766

Department of Health. (2002). AIDS/HIV infected health care workers: Guidance on the management of infected health care workers and patient notification. Available at: http://www.dh.gov.uk/en/Consultations/Closedconsultations/DH_4076770

Advisory Committee on Dangerous Pathogens (2005). Biological agents: Managing the risks in laboratories and health care premises. Available at: http://www.hse.gov.uk/biosafety/information.htm

Collective guidance and advice pages/downloads on all aspects of BBV infection control, including occupational exposure and related topics, available at: http://www.hpa.org.uk/infections/topics_az/bbv/guidelines.htm

Guidance documents for health care workers on Hepatitis B and C – as well as related links - are available from the Advisory Group on Hepatitis (AGH) at: http://www.advisorybodies.doh.gov.uk/agh/publications.htm

Also, in HIV, from the Expert Advisory Group on Aids (EAGA) at: http://www.advisorybodies.doh.gov.uk/eaga/publications.htm

The Medicines and Healthcare products Regulatory Agency (MHRA) have prepared a publication that is endorsed by the MHRA's Microbiology Advisory Committee (MAC) that provides advice on all aspects relating to decontamination of medical equipment. The "MAC Manual" is available at: http://www.mhra.gov.uk/Publications/Safetyguidance/Otherdevicesafetyguidance/CON007438

The MHRA also provide more specific guidance relating to other aspects of decontamination. For example, guidance on the decontamination of community equipment loaned for home or community use is available at: http://www.mhra.gov.uk/home/idcplg?IdcService=GET_FILE&dDocName=CON007314&RevisionSelectionMethod=LatestReleased

More specific guidance is available for:

a. GPs and Primary Care Trusts (PCTs)

The British Medical Association (BMA) publishes advice for members - Testing for blood borne viruses BMA guidance for medical staff. This document can be found at: http://www.bma.org.uk/ap.nsf/Content/BBVguidance. Password access is required.

The BMA Medical Students Committee has produced a downloadable document on Testing medical students for blood borne viruses: Information and guidance. Available from: www.bma.org.uk. The Medical Students Committee represents medical student views on a working group, as set up by the Medical Schools Council, in order to develop an occupational BBV testing protocol for medical schools.

Additional information is published by the Royal College of General Practitioners (2007). Guidance for the prevention, testing, treatment and management of hepatitis C in primary care (Includes appendices on: hepatitis A and B vaccination guidance, hepatitis B and HIV). Available at: http://www.smmgp.org.uk/download/guidance/guidance003.pdf

General Practitioner related enquiries can be made directly via:

Royal College of General Practitioners
14 Princes Gate
Hyde Park
London
SW7 1PU
Phone: 0845 456 4041

Fax: 02072253047
Email: info@rcgp.org.uk

b. Dentists

The British Dental Association (BDA) recognises that all members of the dental team have a responsibility to follow infection control guidelines to ensure safe practice within dentistry. The nature of dental practice, involving the treatment of emergency cases, planned but unscreened cases as well as major, planned dental surgery within the hospital setting, means that there is an opportunity for staff and client exposure to BBV. Dental surgeons, dental hygienists, dental nurses, support technicians and clients must all take appropriate precautions to protect themselves and others.

The BDA has published detailed guidance on this subject, including topics such as patient confidentiality, dental surgery design, cleaning and disinfection. This document is available from the BDA web site:

The British Dental Association. (2003). Advice sheet A12: infection **control** in dentistry. Available at: http://www.bda.org/advice/docs/A12.pdf or from the DH website at www.dh.gov.uk.

c. Care homes

The following document is available via the Department of Health (DH) to ensure that all reasonable steps are taken to protect residents and staff from acquiring infections in care homes. It provides information and guidance on requirements and recommendations to proprietors and people in charge of homes, and to the Commission for Social Care Inspection (CSCI) on the prevention and control of infection. It includes information on blood borne virus transmission, associated risk assessment and infection control.

Infection Control Guidance for Care Homes. (2006).
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4136381

Additional DH guidance exists to ensure that all reasonable steps are taken to protect residents and staff from infections acquired in residential and nursing homes. It offers guidance to proprietors and officers in charge of homes and to officers involved in registration and inspection. Consideration is given to universal infection control procedures, and related matters such as deaths, food hygiene, immunisation, laundry and personal hygiene. Also covered are issues relating to specimens and waste. The final section gives advice on how to prevent the spread of infection if individual cases occur in residents, with an extensive list of possible diseases. No electronic downloadable version of this document is currently available but further information can be obtained from:

Guidelines on the control of infection in residential and nursing homes. Department of Health. (1996).
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4009356

d. Cleaning services (including laundry services)

Controlling occupational exposure risk to laundry workers

The various categories of soiled linen are described elsewhere (Part 3). Laundry workers may be in direct contact with used / infected linen if they are involved in front line sorting of linen prior to washing and disinfection. The use of personal protective equipment is therefore necessary to mitigate the risk associated with handling these materials.

The current 1995 laundry guidance recommends the use of waterproof gloves and a waterproof apron, as well as availability of fresh overalls, to allow changes of work ware, as necessary. More recent laundry advice provided for care homes additionally places particular emphasis on the hand washing facilities having lever taps, hot and cold running water, liquid soap and disposable paper towels.

Occupational health provisions for laundry workers should include the option of appropriate vaccination, e.g. for hepatitis B. COSHH requires that if a risk assessment shows there to be a risk of exposure to biological agents for which vaccines exist, then these should be offered if the employee is not already immune.

Risks associated with contaminated laundry

Contaminating microorganisms will always be associated with Used / Infected linen and can be physically removed to some extent by washing, using warm water and detergent. This cleaning process only becomes an effective disinfection process as temperatures are raised above 40^{o}C, as described in Part 3. This means that, providing soiled linen undergoes some level of laundering, the risks associated with its re-use are lessened. Maximum reduction of infection risk for contaminated linen can, however, only be achieved by applying carefully controlled high temperature washes and rinses, as described in Part 3. Such systems will always be required where soil levels can be high and those using laundered linen may be susceptible to infection.

Useful guidance is available at:

NHS Executive HSG(95)18. Hospital laundry arrangements for used and infected linen. Available as a PDF download at:
http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Healthserviceguidelines/DH_4017865

Infection Control Guidance for Care Homes (2006). A UK Department of Health publication. Ref. No. 275698. Available at:
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4136381

3 Mortuary and Funeral Services:

There are approximately 600,000 deaths per year in the United Kingdom and about two-thirds of these occur in hospital. Less than 1% of UK deaths are associated with a known or suspected infection, and fewer still relate to known BBV infection (HPA data – 2006*). Precautions, however, are always necessary for those handling human remains, particularly when one considers that 70% of these will be treated with some level of embalming, which involves the embalmer handling the cadaver. Some BBVs are known to remain viable for weeks within body fluids, and since final disposal of the body is usually just 7-10 days after death, then a BBV exposure risk does exist for such workers. This is especially so where body fluids are present outside of the cadaver, as would be the case for those performing invasive post-mortem procedures, handling trauma fatalities or preparing cadavers for burial. The exposure risk is further increased by the necessary use of sharp implements during such procedures.

Within the health care environment opinion may differ among staff on the management of a body associated with an infection, and the indiscriminate use of body bags has been known to cause anxiety for family and carers of the deceased. Useful guidance can be found at:

Health and Safety Executive. (2005). Controlling the risks of infection at work from human remains: A guide for those involved in funeral services (including embalmers) and those involved in exhumation. Available for download at: http://www.hse.gov.uk/biosafety/information.htm

Health and Safety Executive - Health Services Advisory Committee. (2003). Safe working and the prevention of infection in the mortuary and post-mortem room. ISBN 0717622932. From HSE Books.

*The Infection Hazards Of Human Cadavers - Guidelines on Precautions to be taken with Cadavers of those who have died with a known or suspected infection (October 2004 - Review Date: October 2006). Available at: http://www.hpa.org.uk/northwest/resources/Cadaver%20Policy%20-%20Final%20-%20October%202004.pdf

4 Local Authorities:

Local Authority employees are at risk of exposure to BBV through a range of activities, including:

- Refuse collection
- Street cleaning
- Ground maintenance/gardeners
- Public sector housing (especially clearance and renovation)
- Work in education
- Social welfare, especially work with intravenous drug users such as needle exchange schemes

Most Local Authorities in the UK have web-based guidance giving general information on blood borne viruses and risks from handling BBV

contaminated materials. General information is available from the documents below:

Blood borne viruses in the workplace – guidance for employers and employees http://www.hse.gov.uk/pubns/indg342.pdf

UK Health Departments Guidance for Clinical Health Care Workers: Protection Against Infection with Blood-borne Viruses Recommendations of the Expert Advisory Group on AIDS and the Advisory Group on Hepatitis http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4014474.pdf

a. Refuse collection

BBV associated risks in refuse collection (both Local Authority and private contractors) are mainly associated with needlestick injuries from two sources; a) discarded needles from intravenous drug users (IDU) or b) clinical waste incorrectly entering the general waste stream.

The following HSE guidance gives general information on the potential sources and risks:

Handling Needles in the Waste and Recycling Industry (WASTE19) http://www.hse.gov.uk/pubns/waste19.pdf

Environment Agency general information on clinical waste handling:

Environment Agency Waste Management Licensing Technical Guidance on clinical waste management facilities. July 2003. http://www.environment-agency.gov.uk/commondata/acrobat/clinical_guidance_1498316.pdf

The GMB union provide health and safety guidance for refuse collectors, and this includes basic awareness of needlestick injury and the principles of work-related risk assessment. This information is presented as: Waste Industry Health and Safety: Refuse Collection, at - http://www.gmb.org.uk/shared_asp_files/uploadedfiles/%7B4D2FB855-A158-4E63-9D76-76F0C0692F39%7D_Refuse.pdf

b. Education

dealing with blood spillage from pupils with latent infection. Staff may also come across discarded needles from trespassers on educational premises.

The guidance link below is intended to assist local authority social services departments, NHS and Primary Care Trusts and other local service providers in promoting and safeguarding the welfare of children in need in relation to blood borne viruses. It provides general information on dealing with risk of exposure to BBV.

Dept Health guidance Children in Need; HIV and Hepatitis and Blood borne Viruses

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4093509

Blood borne virus educational material, aimed at young people, is produced by HIT; formerly the Mersey Drug Training and Information Centre. HIT was established in 1985 and has an international reputation for raising awareness on drug-related issues. Its BBV-related booklets are produced within the drug use context, and have a strong theme of blood-borne disease prevention.

Main web site: http://www.hit.org.uk/default.asp. Specific HIT guidance for young people on BBV is available at: http://www.hit.org.uk/publicationsBySubject.asp?subject=Blood%2DBorne%2DViruses&sub=17

c. Street Cleaning

Needlestick injury from needles left by intravenous drug users pose a potential risk for staff employed in street cleaning or emptying bins.

Guidance from Health Protection Scotland – Sharps in the community guidance note series GN4 10/99 http://www.documents.hps.scot.nhs.uk/environmental/guidance-notes/sharps-in-the-community.pdf

This guidance note provides information on good practice for the removal of sharps from the community and the removal of blood spillages associated with discarded sharps, together with advice on the collection of discarded sharps, on the storage and disposal of discarded sharps and advice should an employee suffer a needlestick injury.

d. Ground maintenance and gardeners

As with those handling refuse, those working on ground maintenance and in gardening activities may also be exposed to discarded needle in parks and other outdoor public areas. The workers' Union UNISON acknowledges this potential route of worker exposure in its guidance to members, Needlestick injuries in local government. The document offers general advice that is relevant for these service occupations, and discusses the nature of the risk, the scale of the risk within the UK, controls required of council employers and how the worker should respond if injury of this kind occurs. The advice page is available at: http://www.unison.org.uk/safety/doc_view.asp?did=176

St Johns Wales (Cymru) have set up a partnership with commercial waste handlers to provide useful information on the problem of Drug Related Litter, its handling and its removal. A dedicated Web site includes useful links to those who can offer further advice and assistance with this issue. The St Johns site is available at: http://www.drugrelatedlitter.org.uk/background.html

e. Needle exchange sites

Workers administering needle exchange schemes and working at exchange sites are at risk of exposure to BBV either from inadvertent needlestick during disposal of used needles or from malicious needlestick from IDU. Generic guidance above provides relevant information. Many town and city councils produce guidance for their residents. Guidance, produced by the Brighton and Hove needle exchange scheme, is available via the Home Office web site at: http://drugs.homeoffice.gov.uk/publication-search/dip/brighton-hove-needle-exchange. This document contains basic information on actions required following needlestick injury.

5 Emergency Services / responders:

Because of the nature of their work, personnel within the emergency response services may be at risk from exposure to BBV. In particular, the following groups fall within this 'at risk' category:

a. Police

Many occupational roles exist within the police services, including those who do not work as active, front line enforcement officers. Those sections of the service at risk of BBV exposure are:

- All Operational Police Officers. Within this group there are those who are placed at greater risk due to their specialist roles e.g. Custody and Coroners Officers;
- Special Constables; and
- Support Staff who are exposed to blood and body fluids as part of their work e.g. Scenes of Crime Officers

Relevant guidance is produced by many UK police forces, usually by occupational health professionals. During the preparation of this guidance occupational health providers serving the police services cited the Thames Valley guidance as a point of reference. Others noted that this on-line document – and others - might require updating in line with new medical recommendations. Examples of Police related documents can be found at:

Dumfries and Galloway Constabulary - Policy on blood borne viruses. 2002. http://www.dumfriesandgalloway.police.uk/foi/class_cat/policy/bb_virus.pdf

Devon & Cornwall Constabulary - Force Policy & Procedure Guideline Infectious Diseases. Reference Number D61 (2007). http://www.devon-cornwall.police.uk/v3/pdfstore/HS_D061open.pdf

Kent Police - Sharps injury policy. (Document code L97). 2006. http://www.kent.police.uk/About%20Kent%20Police/Policy/l/l97.html

Thames Valley Police - Policy for protection against infection with blood borne viruses (2002). http://www.thamesvalley.police.uk/news_info/freedom/policies_procedures/pdf/Blood%20Borne%20Viruses.pdf

b. Fire

Fire fighter search teams, and those responding to road traffic accidents and other situations likely to involve trauma injury, can potentially be exposed to blood and bodily fluids. As with the Police service, guidance has been generated by some city and/or regional fire services, and some of this material is available at the Fire-fit steering group web site: http://www.firefitsteeringgroup.co.uk/. This group promotes fitness and health in the UK Fire and Rescue Service.

Also;

Infection control policy. [incorporating the Policy on Human Immunodeficiency Virus (HIV), Acquired Deficiency Syndrome (AIDS) and Hepatitis B Virus (HBV)]. 2002. http://www.london-fire.gov.uk/lfepa/reports/2002/fep239.rtf

c. Ambulance

In January 2008 The Ambulance Services Association (ASA) merged with the NHS Confederation (NHSC) to form the Ambulance Service Network. At the time of writing, information on the new Ambulance Service Network was in a state of transition, with bulletins available at: (http://www.nhsconfed.org/ambulance-trusts/index.cfm). The ASA has previously compiled guidance jointly with the Health Protection Agency, which enables all NHS Ambulance Services to issue their own local procedures based on the national guidance. It is provided to Services such that it can be added to or amended in terms of any locally agreed policies or information required e.g. local contact numbers, or specific requirements of the devolved Health Departments. The document contains information on BBV transmission, occupational health support and post exposure procedures, and can be found at:

Managing Healthcare Associated Infection & Control of Serious Communicable Diseases in Ambulance Services.
http://www.asa.uk.net/content_files/files/ASAIPCguidanceA4size0905.pdf

d. Vehicle recovery

The potential exposure of motor vehicle recovery, repair and maintenance workers to BBVs, and the essential risk assessments and control measures required to protect them, are considered within the following document:

Infection at work: Controlling the risks. A guide for employers and the self-employed on identifying, assessing and controlling the risks of infection in the workplace. Available at:
http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4070103.pdf

Despite the potential, within the UK there appear to be no recent cases of BBV transmission as a result of exposure during motor vehicle recovery or

repair. Related enquiries made during the preparation of this guidance suggest that industry representatives in this sector do not currently provide their own infection control guidance for their members.

e. First aiders

St John Ambulance offers courses to train people as both first aiders and appointed persons (to oversee first aid needs and manage any incidents that may occur). They also offer courses to ensure that first aid knowledge is kept up-to-date, and course elements include training courses for the workplace that involve control of bleeding and treatment of wounds. These courses include hazard awareness and risk assessment, and detailed information can be obtained at:

St. John Ambulance: Training courses for the workplace.
http://www.sja.org.uk/sja/training-courses/courses-for-the-workplace.aspx

Numerous regional ambulance services also provide infection control information related to first aid treatment, and this can be tailored towards responses in the work place. An example is that provided by the North West Ambulance Service NHS Trust at: http://www.firstaid-training.com/infectioncontrol.asp.

General enquiries should be directed to the Ambulance Service Network at: http://www.nhsconfed.org/ambulance-trusts/index.cfm, or Tel. 020 7074 3240

5 Custodial Services:

The National Aids Trust (NAT - http://www.nat.org.uk) reports that prisoners in the UK are disproportionately affected by blood-borne virus infections; NAT states that this is due in part to drug use prior to incarceration, as well as needle use and unprotected sex within prison. NAT report that the most recent data available show prisoners to be fifteen times more likely to be infected with HIV, and over twenty times more likely to be infected with Hepatitis C, than the general population in the UK. In an attempt to improve this situation NAT and others have produced guidance and advice for the inmates and staff of the prison community:

a. Prison / detention centres

HM Prison Service - Blood Borne and Related Communicable Diseases. This document is available at:
http://pso.hmprisonservice.gov.uk/PSO_3845_blood_borne_related_communicable_diseases.doc.

Tackling Blood Borne Viruses in Prison – A framework for best practice in the UK. National Aids Trust. http://www.nat.org.uk/document/255

HIV and hepatitis in UK prisons – addressing prisoners' healthcare needs. Prison Reform Trust and National Aids Trust:
http://www.nat.org.uk/document/105

Specific occupational advice is presented in: HM Prison Service Instruction PSO 8900 – Occupational Health – Blood borne viruses. http://psi.hmprisonservice.gov.uk/PSI_2007_05_amendment_to_PSO_8900_occupational_health.doc

6 Beauty Industry:

Many aspects of governance for the beauty industry are addressed by training and guidance booklets produced by the UK Hairdressing and Beauty Industry Authority (Habia - http://www.habia.org/). Habia is the Government approved standards setting body for hair, beauty, nails, spa therapy, barbering and African-Caribbean hair, and creates the standards that form the basis of all qualifications including NVQs, SVQs and apprenticeships, as well as codes of practice.

A central point of contact for information, Habia provides guidance on careers, business development, legislation, salon safety, equal opportunities, and is responsible to government on industry issues such as training and skills. Relevant links to infection control guidance published by this organisation can be found below:

a. Hairdressing

The Hairdressing and Beauty Industry Authority (UK) – hairdressing pages http://www.habia.org/news.asp?PT_ID=102&strPageHistory=cat

b. Beauticians

The Hairdressing and Beauty Industry Authority (UK) – beautician pages http://www.habia.org/news.asp?PT_ID=205&strPageHistory=cat

General information on hygiene related to beauty therapy is provided by HABIA at: http://www.habia.org/uploads/hygiene_booklet.pdf Tattooing, Ear and body piercing

Body piercing and tattooing are areas that, until recently, would likely have been omitted from occupational guidance. However, these treatments are now performed at many permanent premises across the UK, and some peripatetic (mobile) business is also conducted. These treatments invariably involve the use of needles (sharps) to pierce the body, either in the form of intra-dermal ink injection using a tattooing machine for tattooing, or using deeper needle penetration during body piercing; the latter creates a tunnel through which the jewellery item is inserted. Such treatments therefore carry with them an associated risk of localised or blood-borne infection, unless the operator takes appropriate infection control measures.

Exposure risk to the worker

The appropriate means for disposal of contaminated sharps and other waste is considered elsewhere (Part 3). Accidental sharps injury is the most likely way in which occupational BBV infection might be acquired during skin

piercing activity. In order to minimise the risk of such injury, precautions should be observed to maintain a 'sharps safe' working environment.

Exposure risk to the client

For modern body piercing and tattooing activities the availability of cheap, high quality needles means that a one-use-only needle approach is cost-effective, convenient and safe. Some tattooing operators used to clean and re-sterilize needles, but this practice is now rare and is discouraged by industry representatives and enforcement authorities. One-use-only sharps minimises the risk of BBV cross infection between clients. Detailed advice can be obtained from existing guidance and trade union sources at:

HSE Local Authority Circular (LAC); detailed guidance on cosmetic piercing tattooing and scarification (LAC 76-2). Available at http://www.hse.gov.uk/lau/lacs/76-2.htm

HSE Local Authority Circular (LAC); detailed guidance on micropigmentation (LAC 14-1). Available at http://www.hse.gov.uk/lau/lacs/14-1.htm

The Tattooing and Piercing Industry Union (TPI), in association with the GMB. At: http://www.tpi.org.uk/ (email – info@tpi.org.uk).

7 Sports and Recreation

Some information relating to BBV transmission in sport is provided in Part 3 of this guidance. In addition, The Institute of Sport and Recreation Management provides general infection control information related to facilities such as spa pools and swimming pools, and membership is required for those wishing to access some areas of its site, including guidance at: http://isrm.co.uk/.

The organisation HIVSport has been formed to provide education and training for people in all roles in sport around, and this has specific focus on HIV and other health related matters. Further information can be obtained at: http://www.hivsport.org.uk/index.php.

The evidence base for BBV transmission through sport, as well as risk assessments and preventative advice on this topic, are presented in a review by Kordi and Wallace accessible via: (Br. J. Sports Med. 2004; 38: 678-684).

8 Other services

a. Decontamination services

The UK government has web pages dedicated to offering information and advice regarding actions to take following an incident involving biological agents. The information on offer covers, but is not confined to, dealing with large scale incidents involving Chemical, Biological Radiological or Nuclear (CBRN) materials. The scope of the guidance available is intended to include accidents and domestic spillages etc.

The UK Resilience Website is a news and information service for emergency practitioners from the Cabinet Office and contains information, advice and links to related guidance, including decontamination of people, buildings and the open environment. This information is available at: http://www.ukresilience.gov.uk/emergencies/cbrn

The UK Government has set up an agency to help streamline responsible authorities' ability to decontaminate the built and open environment following a deliberate or accidental CBRN release or major accidental releases of hazardous materials (HAZMAT). The UK Government Decontamination Service will provide advice and guidance to support those responsible for decontamination during contingency planning and actual incidents. The Government Decontamination Service wepages can be found at: http://www.defra.gov.uk/gds

b. Controlling risks to sewage workers

Workers whose activities bring them into contact with untreated sewage and sewage products are at risk of contracting a work-related infection. In particular, raw sewage, mainly from water containing excrement, can also contain industrial effluent and debris, such as sanitary towels, condoms, plastic etc. Most contracted illnesses are relatively mild cases of gastroenteritis, but potentially fatal diseases, such as leptospirosis (Weil's disease) and hepatitis, have been reported. These may occur because of the potential for cross infection via the skin and mucous membranes. Not all cases are reported because people often fail to recognise the link between illness and work.

Detailed guidance is available:

The Health and Safety Executive. (1996). Working with sewage: The health hazards - A guide for employers. Available at: http://www.hse.gov.uk/pubns/indg198.htm.

Advice is also available as a short leaflet:

The Health and Safety Executive. (1996). Working with sewage – the health hazards. ISBN 0 7176 0987 1, or at: http://www.hse.gov.uk/pubns/indg197.pdf

c. Remote installations

Guidance published by the Health Institute (London) is available on Occupational infection with blood borne viruses for health care workers in remote sites or installations (offshore) and is available at: http://www.energyinst.org.uk/content/files/guidance.pdf

Appendix 4 – General contact details not previously mentioned in other sections

HEALTH AND SAFETY EXECUTIVE INFOLINE:
Infoline is HSE's public enquiry contact centre and provides access to workplace health and safety information, guidance and expert advice.
Telephone: 0845 345 0055
Fax: 0845 408 9566
Minicom: 0845 408 9577
E-mail: hse.infoline@natbrit.com
Opening hours: 8 am - 6 pm (Monday to Friday)
http://hse.gov.uk/contact/index.htm

HEALTH PROTECTION AGENCY INFECTION CONTROL CONTACTS
Health Protection Agency
Centre for Infections
61 Colindale Avenue
London
NW9 5EQ
Tel: 020 8200 4400
Fax: 020 8200 7868
Email: infections@hpa.org.uk
http://www.hpa.org.uk/hpa/contacts/contact_us.htm

DEPARTMENT OF HEALTH
The Department of Health
Richmond House
79 Whitehall
London SW1A 2NS
Tel: 020 7210 4850
Lines are open from 09:00 to 17:00, Monday to Friday
Text-phone (for deaf and hard of hearing): 020 7210 5025
Lines are open from 09:00 to 17:00, Monday to Friday.
http://www.dh.gov.uk/en/ContactUs/index.htm

DEPARTMENT FOR TRANSPORT
Department for Transport
Great Minster House
76 Marsham Street
London
SW1P 4DR
Tel: 020 7944 8300
Fax: 020 7944 9643
General email enquiries: FAX9643@dft.gsi.gov.uk
http://www.dft.gov.uk/contact

NHS DIRECT
For Health Information and Advice, contact NHS Direct on 0845 4647
For Corporate Information and Head Office, contact NHS Direct on 020 7599 4200
Write to Chief Executive
NHS Direct
7th Floor
207 Old Street
London EC1V 9NR
If you are feeling unwell now call NHS Direct on 0845 4647 for nurse advice and health information. The helpline is open 24 hours.
http://www.nhsdirect.nhs.uk/

THE NATIONAL AIDS TRUST
New City Cloisters,
196 Old Street,
London, EC1V 9FR
Tel: 020 7814 6767
Fax: 020 7216 0111
Email: info@nat.org.uk
http://www.nat.org.uk/About%20NAT/Contact%20Us

NHS HEPATITIS C INFOLINE
If you have any concerns about hepatitis C or would like further information, please contact the Hepatitis C Information Line on 0800 451451.
http://www.hepc.nhs.uk/about_hepc.html

References

1 The Health and Safety at Work etc Act 1974 SI 1974/1439 The Stationery Office 1974 ISBN 0 11 141439 X

2 **The Control of Substances Hazardous to Health Regulations 2002 Approved Code of Practices and Guidance** L5 (Fourth edition) HSE Books 2002 ISBN 0 7176 2540 6

3 **Management of Health and Safety at Work: Management of Health and Safety at Work Regulations 1999: Approved Code of Practice and Guidance** L21 (Second edition) HSE Books 2000 ISBN 0 7176 2488 9

4 **A Guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995** (Second edition) HSE Books 1999 ISBN 0 7176 2431 5

5 **Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance** L22 (Second edition) HSE Books 1998 ISBN 0 7176 1626 6

6 **A Guide to the Genetically Modified Organisms (Contained Use) Regulations 2000** L29 HSE Books 2000 ISBN 0 7176 1360 1

7 **Successful health and safety management** HSG65 HSE Books 2003 ISBN 0 7176 1276 7

8 Health Services Advisory Committee **Management of health and safety in the health service: information for directors and managers** HSE Books 1994 ISBN 0 7176 0844 1

9 Universities and Colleges Employers Association/Universities Safety Association **University Health and Safety Management: Code of Best Practice** 2001 ISBN 0 9532431 3 3

10 An introduction to health and safety INDG259 HSE Books

11 Managing Health and safety: Five steps to success INDG275 HSE Books

12 **Safety representatives and safety committees** L87 (Third edition). HSE Books 1996 ISBN 0 7176 1220 1

13 **A guide to the Health and Safety (Consultation with Employees) Regulations 1996. Guidance on regulations** L95 HSE Books 1996 ISBN 0 7176 1234 1

14 Consulting employees on health and safety: A guide to the law INDG 232 HSE Books

15 Five steps to risk assessment INDG163 HSE Books 2003

16 Infection at work: Controlling the risks . Advisory Committee on Dangerous Pathogens

17 Biological Agents: Managing the risks in laboratories and healthcare premises. Advisory Committee on Dangerous Pathogens

18 **The Medical Devices Regulations 2002 (As Amended).** Statutory Instrument 2002 No. 618. The Stationary Office 2002

19 **Guidance on Personal Protective Equipment at Work Regulations 1992.** L25 HSE Books 2005 ISBN 0 7176 6139 3

20 Advisory Committee on Dangerous Pathogens **The management, design and operation of microbiological containment laboratories** HSE Books 2001 ISBN 0 7176 2034 4

21 Safe Working and the prevention of infection in clinical laboratories and similar facilities, Health Services Advisory Committee, ISBN 071762 5133

22 Permit to work systems INDG98 (rev3) HSE Books 2002

23 Health Protection Agency - Reporting of occupational exposure to blood borne viruses – history and how to report

24 Department of Health - Immunisation against infectious disease - "The Green Book"

25 Department of Health - Guidance for clinical health care workers: protection against infection with blood-borne viruses

26 Health Protection Agency – Eye of the Needle

27 The UK Health Departments Guidance for Clinical Health Care Workers: Protection against infection with blood-borne viruses. Recommendations of the expert advisory group on Aids. Link: (http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4002766&chk=sjOK8W)

28 John M. Cavanaugh and Albert I. King. 1990. Control of Transmission of HIV and Other Bloodborne Pathogens in Biomechanical Cadaveric Testing. Journal of Orthopaedic Research. 8; 159-166. Raven Press, Ltd., New York

29 Thompson SC, Boughton CR, Dore GJ. 2003. Blood-borne viruses and their survival in the environment: is public concern about community needle stick exposures justified? Aust N Z J Public Health. 27(6):602-7.

30 J van Bueren, R A Simpson, P Jacobs, and B D Cookson. 1994. Survival of human immunodeficiency virus in suspension and dried onto surfaces. J Clin Microbiol. 1994 February; 32(2): 571–574.

31 The Medicines and Healthcare products Regulatory Agency (MHRA). The MAC

Manual. Available from:
http://www.mhra.gov.uk/Publications/Safetyguidance/Otherdevicesafetyguidance/CON007438 32

32 DB 2003(05) Management of Medical Devices Prior to Repair, Service or Investigation - http://www.mhra.gov.uk/home/idcplg?IdcService=SS_GET_PAGE&ssDocName=CON007315&ssSourceNodeId=828&ssTargetNodeId=572)

33 Biological agents: Managing the risks in laboratories and healthcare premises http://www.hse.gov.uk/biosafety/biologagents.pdf; also 'Safe Working and the Prevention of Infection in Clinical Laboratories and Similar Facilities', HSAC Guidance,

34 Provision and Use of Work Equipment Regulations, 1998. ISBN-13: 9780110795997 / ISBN: 0110795997.

35 Environment Protection Act 1990. Full text of the Act available on-line at: http://www.opsi.gov.uk/acts/acts1990/Ukpga_19900043_en_1.htm

36 Health Technical Memorandum (HTM) 07-01: Safe Management of Healthcare Waste. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_063274

37 Safe Management of Healthcare Waste (2007). Royal College of Nursing. ISBN 978 1 904114 76 5. http://www.rcn.org.uk/__data/assets/pdf_file/0013/111082/003205.pdf

38 Guidance for clinical health care workers: protection against infection with blood-borne viruses - Recommendations of the Expert Advisory Group on AIDS and the Advisory Group on Hepatitis: http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4002766&chk=sjOK8W

39 P Nyiri, T Leung, MA Zuckerman. Sharps discarded in inner city parks and playgrounds – risk of bloodborne virus exposure. Commun Dis Public Health 2004; 7(4): 287-8

40 http://www.mhra.gov.uk/

41 Immunisation against infectious diseases – 'The Green Book', 2006 Edition, HMSO, ISBN 9780113225286. Hepatitis B information is available at link: http://www.dh.gov.uk/prod_consum_dh/idcplg?IdcService=GET_FILE&dID=115985&Rendition=Web)

42 Exposure prone procedures are those where there is a risk that injury to the health care worker could result in their blood contaminating a patient's open tissues. A list of exposure prone procedures is provided in the document: http://www.advisorybodies.doh.gov.uk/eaga/pdfs/hiv_workers_280705.pdf

43 Immunisation against infectious diseases – 'The Green Book', 2006 Edition, HMSO, ISBN 9780113225286: http://www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/Greenbook/DH_4097254)

44 Thompson SC, Boughton CR, Dore GJ. 2003. Blood-borne viruses and their survival in the environment: is public concern about community needlestick exposures justified? Aust N Z J Public Health. 27(6):602-7.

45 Medicines and Healthcare Products Regulatory Agency Safety Notice SN 2002(02) - Dry heat (hot air) sterilizers. Available from the MHRA at: http://www.mhra.gov.uk

46 Bench-top steam sterilizers - guidance on purchase, operation and maintenance: Medical Devices Agency, Device Bulletin 2002(06) October 2002. At: http://www.mhra.gov.uk/home/groups/dts-bi/documents/publication/con007327.pdf

47 Sterilization, disinfection and cleaning of medical equipment. The MAC Manual Part I, 2002 edition, Medicines and Healthcare Products Regulatory Agency (MHRA) Microbiology Advisory Committee to Department of Health. http://www.mhra.gov.uk/Publications/Safetyguidance/Otherdevicesafetyguidance/CON007438

48 Medicines and Healthcare Products Regulatory Agency Safety Notice SN 2002(02) - Dry heat (hot air) sterilizers. Available from the MHRA at: http://www.mhra.gov.uk

49 NHS Executive HSG(95)18. Hospital laundry arrangements for used and infected linen (under review). Available as a PDF download at: http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Healthserviceguidelines/DH_4017865

50 Infection Control Guidance for Care Homes (2006). A UK Department of Health publication. Ref. No. 275698. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4136381

51 The UK Health Departments Guidance for Clinical Health Care Workers: Protection against infection with blood-borne viruses. Recommendations of the expert advisory group on Aids. Link: (http://www.dh.gov.uk/PublicationsAndStatistics/Publications/PublicationsPolicyAndGuidance/PublicationsPolicyAndGuidanceArticle/fs/en?CONTENT_ID=4002766&chk=sjOK8W)

52 Uniforms and workware: An evidence base for developing local policy http://www.dh.gov.uk/prod_consum_dh/idcplg?IdcService=GET_FILE&dID=148636&Rendition=Web

53 HIV post-exposure prophylaxis: Guidance from the UK Chief Medical Officer's Expert Advisory Group on AIDS. Department of Health / EAGA. 2004.

Available from:
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4083638

54 HSE (2002). Control of substances hazardous to health. The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance L5 (Fourth edition) HSE Books ISBN 0 7176 2534 6

55 HSE, Advisory Committee on Dangerous Pathogens (2001). The management, design and operation of microbiological containment laboratories. HSE Books ISBN 0717620344

56 HSE, Advisory Committee on Dangerous Pathogens (2005). Biological agents: Managing the risks in laboratories and healthcare premises. Available at http://www.hse.gov.uk/biosafety/biologagents.pdf

57 HSE, Health Services Advisory Committee (2003). Safe working and the prevention of infection in clinical laboratories and similar facilities HSE Books ISBN 0717625133

58 HSE, Health Services Advisory Committee (2003) Safe working and the prevention of infection in the mortuary and post-mortem room. HSE Books ISBN 0717622932

59 Tanner J, Parkinson H. Double gloving to reduce surgical cross-infection (2002). Cochrane Database of Systematic Reviews, Issue 3. Art. No.: CD003087. DOI: 10.1002/14651858.CD003087.pub2. Available at http://www.cochrane.org/reviews/en/ab003087.html

Glossary

COSHH = Control of Substances Hazardous to Health Regulations 2002
MHSWR = Management of Health and Safety at Work Regulations 1999[3]
RIDDOR = Reporting of Diseases, Injuries and Dangerous Occurrences Regulations 1995[4]
PUWER = Provision of Work Equipment Regulations 1998[5]
GMO(CU) = Genetically Modified Organisms (Contained Use) Regulations 2000[6]
PPEWR = Personal Protective Equipment at Work Regulations 1992