BACKGROUND INFORMATION
PART 1. Blood-borne viruses –what they are and how they spread

PART 1

The blood-borne viruses

1. Some viral infections do not cause symptoms so the infected person may not know they have the potential to spread infection. Transmission of infection can occur from one person to another by various routes and over a prolonged time period.

2. Viruses known to be associated with transmission are the human immunodeficiency virus (HIV, which causes *Acquired Immune Deficiency Syndrome* or *AIDS*), and some of the causative agents of acute and chronic viral hepatitis. These viruses may persist in the blood and are known to be endemic in the UK population.

3. Blood- borne viruses that cause hepatitis include hepatitis B virus (HBV) and hepatitis C virus (HCV). Other viruses that cause hepatitis (such as hepatitis A and E) are not usually passed on by blood to blood contact 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 HBV.

4. This guidance will concentrate only on HIV, HBV and HCV. These viruses are listed in Table 1 and are further described in the subsequent sections. The number of occupational exposure incidents relating to blood or other high-risk body fluids are collated and reported bi-annually by the Health Protection Agency (HPA) in their “Eye of the Needle” report (Info box 1.6)

Table 1: Blood- borne viruses covered in this guidance

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)

5. 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.

6. 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

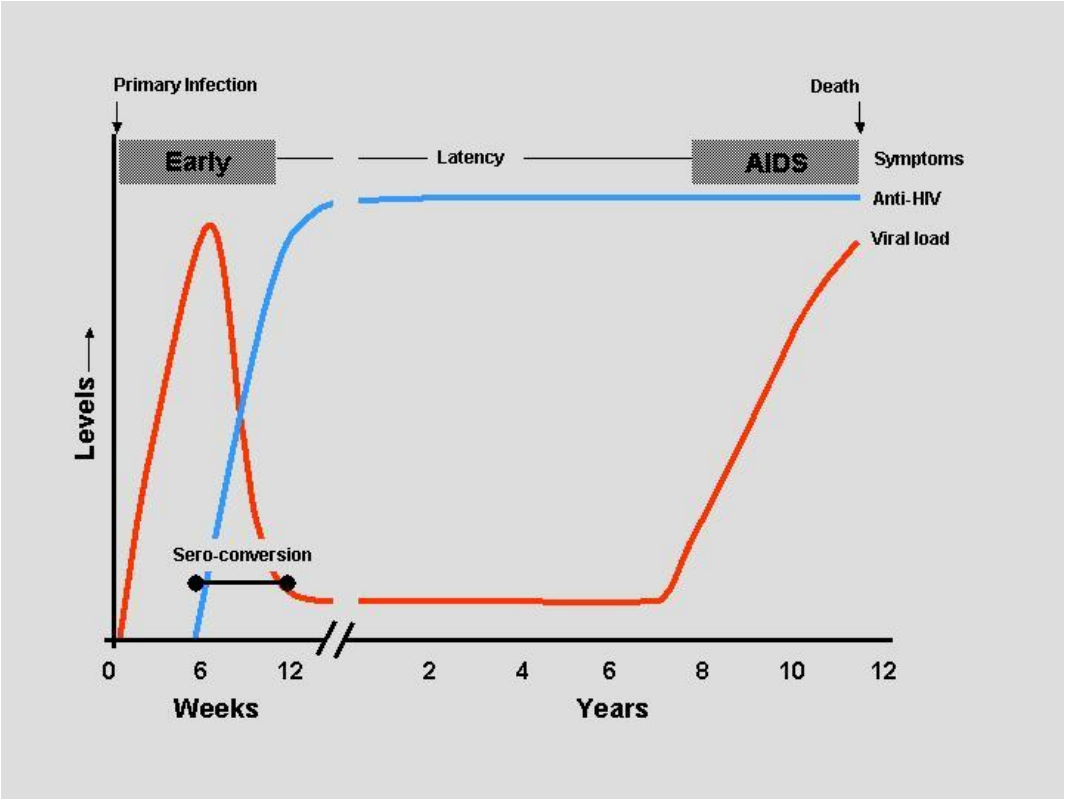
7. HIV infects certain types of white blood cell, specifically helper T-lymphocytes, monocytes and some other cells that are key elements of the human immune system. This usually results in the death of these cells. The hallmark of HIV infection is the gradual loss of helper T-lymphocytes from an infected 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).

8. Several different conditions may occur as a result of HIV infection that precedes 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. When AIDS develops fully, which often takes several years, it is characterised by the appearance of secondary opportunistic infections and tumours.

Transmission of HIV

9. 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 to 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 1.1.

Figure 1.1: Approximate time course of HIV infection



10. 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 trans-placental infection, exposure during delivery or breast-feeding. As a greater understanding of transmission has developed, steps have been taken to mitigate HIV transmission in the UK. These include screening of blood donations, needle exchange programmes and antenatal screening coupled with antiretroviral therapy, obstetric management and avoidance of breastfeeding to prevent mother-to-child

Prevalence of HIV and AIDS in the UK

11. Since the first reports in the 1980s from North America of an immunodeficiency syndrome affecting men who have sex with men (MSM), HIV infection has spread to become 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, and a key contributing factor to this detection is routine antenatal screening.

12. At the end of 2007, it was estimated that 77,400 people were living in the UK with HIV. This equates to around 0.13% of the population. An estimated 28% of carriers were unaware of their infection. 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 1.1: HIV and other Sexually Transmitted Infections in the UK

HIV in the UK: 2008 report is published by the Health Protection Agency. A full copy of the report, can be downloaded at:
http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1227515298354

For further information on HIV prevalence and epidemiology, please visit:
Health Protection Agency HIV and AIDS web pages:
http://www.hpa.org.uk/web/HPAweb&Page&HPAwebAutoListName/Page/1200660065903

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

Hepatitis B virus (HBV)

13. Whilst HBV infection is endemic in the UK, it is more common in developing countries where children often acquire infection from their mothers during birth or through close contact in early infancy. The UK is a low prevalence area, with a carriage rate of 0.1-0.5%, although rates may vary between individual communities.

Pathogenesis of HBV infection

14. 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 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.

15. 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 proteins are secreted into the blood and their presence can be useful markers 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 to their blood and body fluids 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.

Infection with recovery

16. 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 1.2a for acute HBV infection and in Figure 1.2b for chronic HBV infection.

Please note: For purposes of clarity the diagrams below are simplified. Readers interested in a fuller interpretation of Hepatitis B (and C) markers can obtain additional information from:

- The British Liver Trust, at: http://www.britishlivertrust.org.uk/home/health-professionals/literature-for-professionals/a-professionals-guide-to-hepatitis-b.aspx

- Rehermann, B & Nascimbeni, M. 2005. Immunology of hepatitis B virus and hepatitis C virus infection. Nature Reviews; Immunology. **5**; 215-219. Available at: http://www1.od.nih.gov/oir/demystifyingMed/Dm06/HepatitisC/Rehermann-Nascimbeni.pdf

Figure 1.2a: Approximate time course of acute Hepatitis B Virus

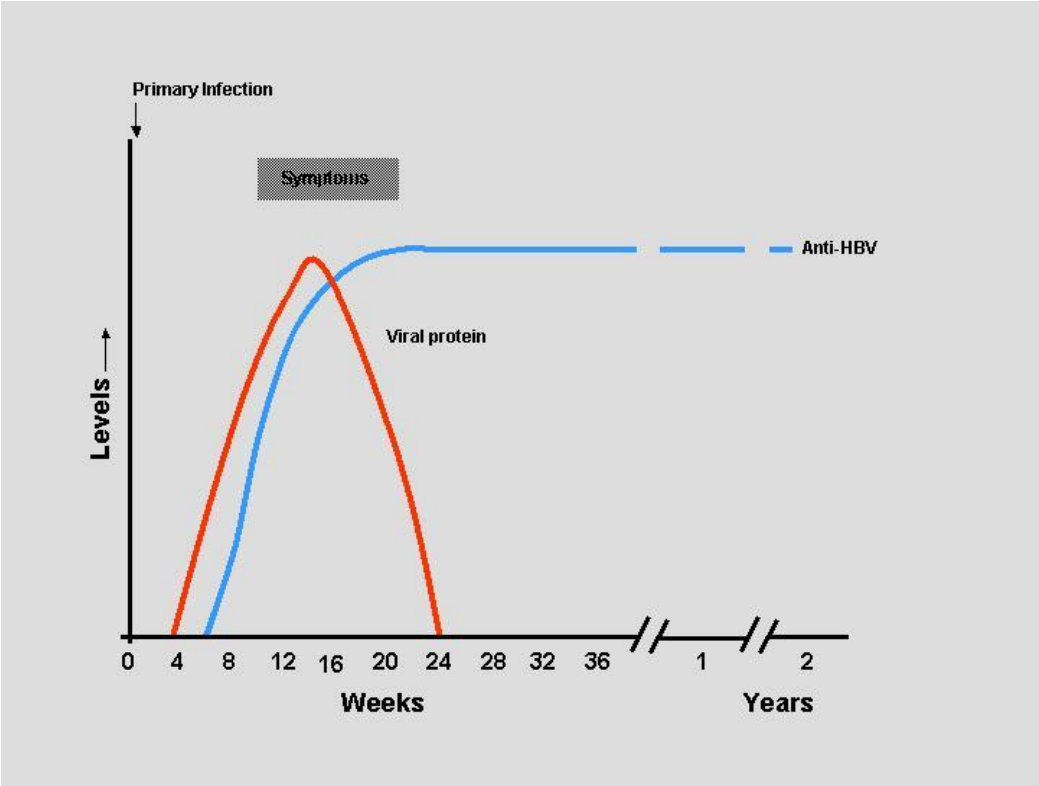
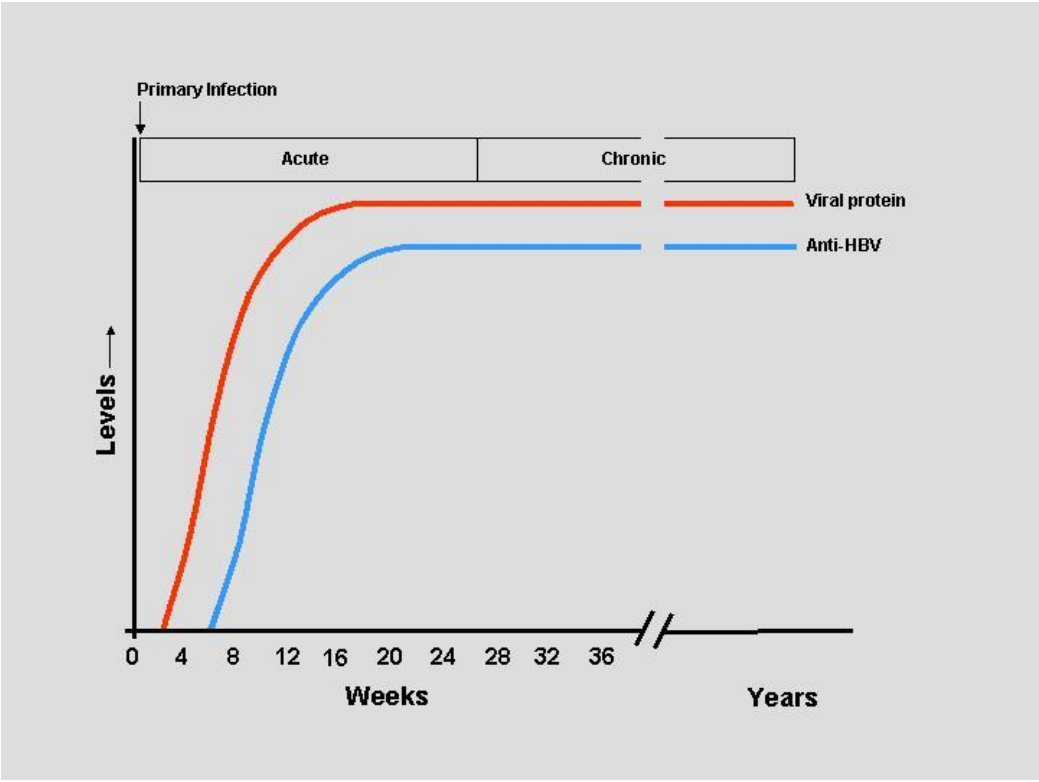


Figure 1.2b: Progression to Chronic Hepatitis B Virus Infection



Transmission of HBV

17. 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 is the most frequently reported route of infection. Transmission to babies from infected mothers has been largely attributed to exposure during or after delivery, with trans-placental infection being apparently rare. Vertical transmission from mother to baby can be prevented by the administration of HBV immunoglobulin (HBIg) and vaccinating the newborn in cases where the mother is infected with the virus. However, provision of HBIg to babies born to positive mothers is currently limited to certain high-risk mothers and those who have had acute HBV infection during pregnancy[1].

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

Prevalence of HBV in the UK

19. 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 of injecting drug use and possibly risk behaviour modification in response to the HIV/AIDS epidemic. The effect of risk reduction programmes, which include the use of needle exchange centres and the immunisation of injecting drug users (IDU), is also likely to have contributed to this decline. However, the Hepatitis B Foundation reports that the frequency of chronic infection is increasing in the UK because of migration from high prevalence areas of the world (see Info box 1.2).

[1] HBIG for babies born to hep b infected mothers. At: http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1195733782578?p=1191942171124

Info box 1.2: Further information on Hepatitis B virus
For further information on Hepatitis B prevalence, epidemiology and treatment please visit: *Health Protection Agency* Hepatitis B web pages: 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 web pages http://www.cdc.gov/ncidod/diseases/hepatitis/b/index.htm Hepatitis B Foundation, UK. Rising Curve: Chronic Hepatitis B Infection in the UK. Available at: http://www.hepb.org.uk/information/resources/rising_curve_chronic_hepatitis_b_infection_in_the_uk/rising_curve.pdf

Hepatitis C virus (HCV)

20. 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 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

21. 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. 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. The Department of health (DH) estimates that between 60 to 80% 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 1.3a for acute HCV infection and in Figure 1.3b for chronic HCV infection.

Transmission of HCV

22. 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. Workplace exposure in the healthcare setting usually occurs as a result of a needle-stick or injury with other contaminated sharp instruments, and rates of occupational exposure and transmission are presented in HPA's "Eye of the Needle" report (see Info box 1.6). 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. There is evidence of increased risk of sexual transmission of HCV in men who have sex with men (MSM), particularly in HIV-infected MSM. 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.

Prevalence of HCV in the UK

23. 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 often higher in major cities or other highly populated regions, compared to other parts of the UK, and is mostly associated with high-risk groups. This is demonstrated by the high incidence of hepatitis C among injecting drug users in Glasgow, London and the North West of England[2]. Recent mathematical modelling data cited by Health Protection Agency (HPA) indicate that, within England and Wales, 191,000 individuals had antibodies to hepatitis C virus (see Info box 1.3). HPA also report 12,000 chronically infected individuals in Wales. In Scotland, (2006), around 50,000 people were estimated to be infected with hepatitis C; 38,000 with chronic infection. Estimates from Northern Ireland suggest that around 4,000 individuals are likely to be chronically infected.

[2] Shooting Up. Infections among injecting drug users in the UK, 2007 (updated 2008). At: http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1224833091550

Figure 1.3a: Approximate time course of acute HCV infection with Recovery

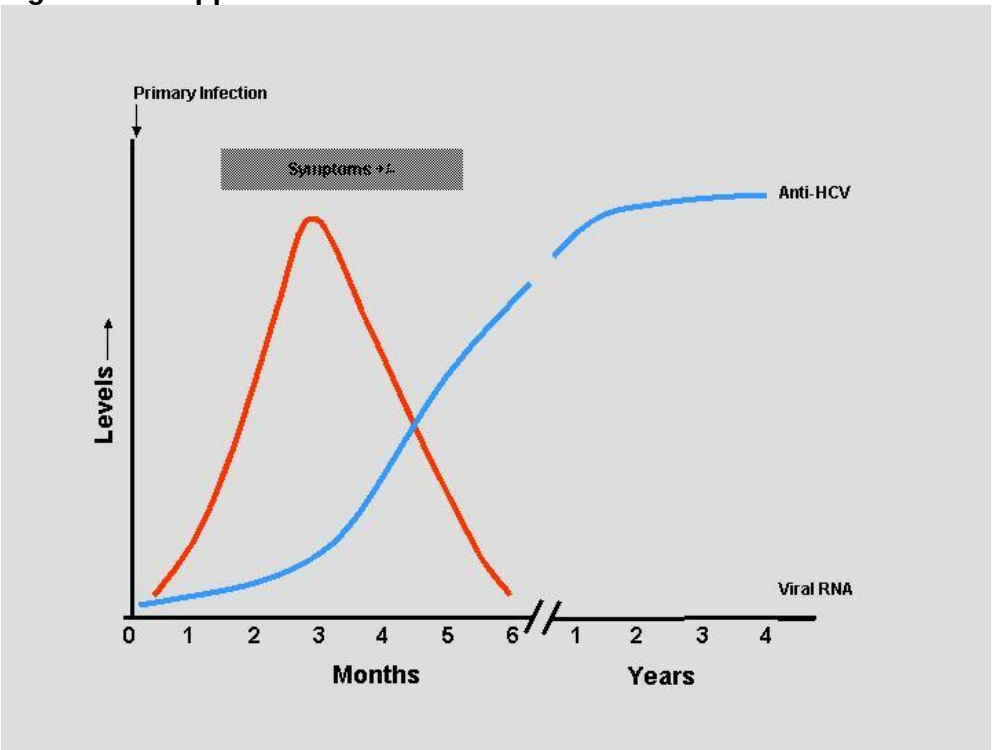
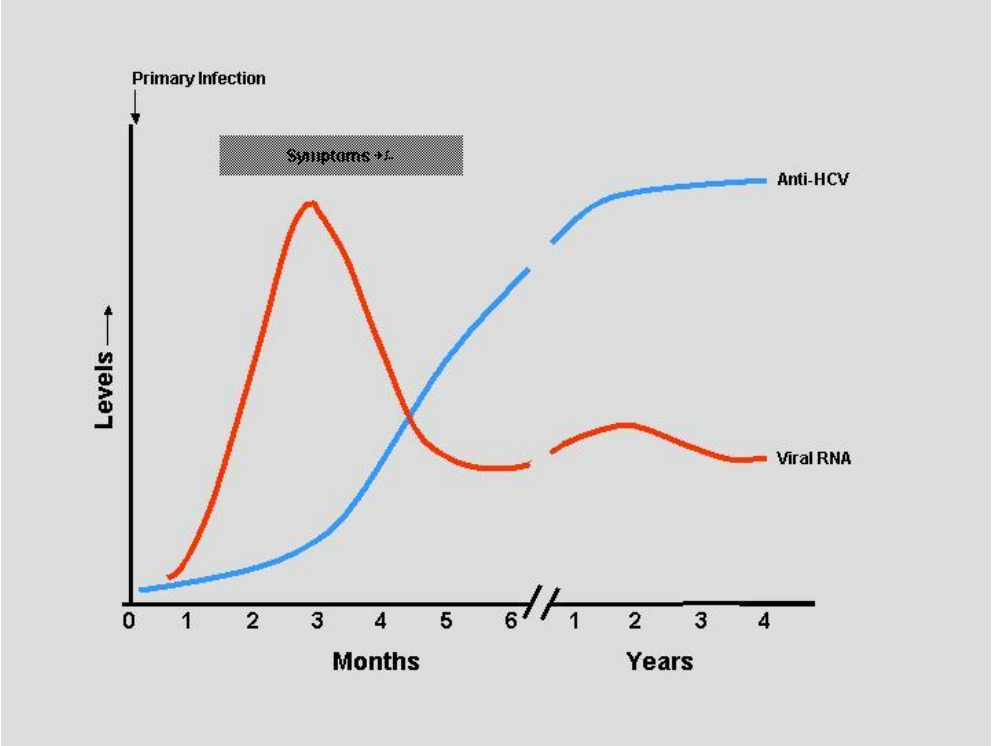


Figure 1.3b: Progression to Chronic HCV infection



24. 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. 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.

25. 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. Hepatitis C can now be treated and around 50% of those individuals clear the infection. 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 1.3: Further information on Hepatitis C

For further information on Hepatitis C prevalence, epidemiology and treatment, please visit

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

Hepatitis C awareness information is available via the NHS Web site at:
http://www.nhs.uk/Livewell/hepatitisc/Pages/Hepatitischome.aspx

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

Department of Health. Hepatitis C Essential information for professionals and guidance on testing (2004). Available at:
http://www.nhs.uk/Livewell/hepatitisc/Documents/Information-for-professionals-19.05.061for-web-15600.pdf

How blood-borne viruses are spread

Routes of transmission

26. As summarised in the introduction, BBVs are transmitted by entry of blood, or other body fluids containing virus, into the body of a susceptible person. The rate of viral transmission varies with the route of exposure, the type of virus, the infectious state of the infectious person and the immune status of the exposed person. The more common routes of exposure associated with transmission include:

- 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). The risks for HBV and HIV can be dramatically reduced by appropriate intervention

27. 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.

28. There is a risk of acquiring a BBV infection via blood transfusion. However, in the UK 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 such as high titre *in vitro* cultures, virus is present in concentrations far exceeding that found in normal body fluids.

Workplace transmission

29. Contaminated sharps exposure in UK health care work is confirmed by HPA as the most common mode of occupational exposure to BBV-infected blood or body fluids, though transmission rates remain low as a proportion of reported incidents (HPA, 2008). Precautions are required to prevent transmission of BBV from patients/clients to workers and vice-versa in the course of invasive procedures.

30. 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 worker
ii. Adequate decontamination of reusable equipment
iii. Safe disposal of single-use equipment

31. Examples of sector specific guidance and advice on preventing workplace exposure to BBV are provided in Appendix 3. 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
- Research, diagnostics and pathology laboratory workers
- 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

Risk of transmission of blood borne viruses in healthcare workers

32. The overall risks of the three most common blood borne viruses being transmitted by an infected patient to a health care worker have been estimated, as shown in Table 2. HBV is the most readily 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.

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

Infection	*Patient to health care worker*
Hepatitis B	Up to 30%**
Hepatitis C	1-3%
HIV	0.3%

NB. Risk of transmission above relates to percutaeous injury; data for HBV are based on exposure in unvaccinated individuals. The sharps causing these injuries are variable. See HPA's "Eye of the Needle " Report (Info box 1.6)
**There is a wide variability in infectiousness of hepatitis B carriers and this rate reflects transmission from Hepatitis B surface antigen positive source.

33. The risk of infection after mucocutaneous exposure is much lower. For HIV, the transmission risk after a single mucocutaneous exposure is probably less than 1 in 1000 (0.1%).

34. A voluntary confidential reporting system for significant occupational exposure incidents involving HIV, HCV and HBV exists in the UK, to which practitioners who provide post-exposure care are asked to contribute. At the time of preparation of this guidance an HCV reporting system is not currently active in Scotland, although Health Protection Scotland does hold HCV diagnosis data for epidemiological purposes[3]. 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. An example of a COSHH-related health recording form is provided at the end of Part 2, and includes a facility to record exposure events and immunisations received.

[3] The Hepatitis C Diagnosis Database. Descriptor and further links available via HCV pages at: http://www.hps.scot.nhs/

35. There have been recorded cases where infected healthcare workers have transmitted BBVs to patients. Policies exist in the UK to prevent health care workers from performing procedures that put patients at risk of infection and these policies have substantially reduced transmission in this setting. Guidance is available for both existing healthcare workers (see Info box 1.4), and those new to the NHS (see Info box 1.5).

HIV

36. The number of health care workers that have become infected with HIV as a result of workplace 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 workplace 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), but between 2000 and 2007 no new seroconversions were reported (HPA's "Eye of the Needle" report, Info box 1.6). 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. Management of an exposure incident is discussed in Part 4 of this guidance.

Info box 1.4: Further guidance and policy on infected healthcare workers

In the UK, stringent policies restrict healthcare workers infected with BBVs from performing procedures that put patients at risk. Further guidance can be found below:

HIV

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/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4116415; In Scotland: http://www.scotland.gov.uk/Publications/2002/09/15338/10619; In Wales, health circulars are available for HIV and other BBV infections at: http://www.wales.nhs.uk

Hepatitis B

Health Service Guidelines HSG 93(40) Protecting healthcare workers and patients from hepatitis B and its Addendum issued in 1996 under cover of EL(96)77. Available at:
http://www.dh.gov.uk/assetRoot/04/07/93/06/04079306.pdf;
http://www.dh.gov.uk/assetRoot/04/07/93/07/04079307.pdf;
http://www.dh.gov.uk/assetRoot/04/08/06/27/04080627.pdf;
http://www.dh.gov.uk/assetRoot/04/08/06/26/04080626.pdf

Health Service Circular HSC 2000(020) Hepatitis B infected healthcare workers. Available at:
http://www.dh.gov.uk/assetRoot/04/01/22/57/04012257.pdf;
http://www.dh.gov.uk/assetRoot/04/05/75/38/04057538.pdf

Hepatitis B infected healthcare workers and antiviral therapy. Available at: http://www.dh.gov.uk/prod_consum_dh/idcplg?IdcService=GET_FILE&dID=135983&Rendition=Web; In Scotland, information on hepatitis B in healthcare workers is available for via the 'new workers' health clearance link below. The DH guidance is also currently cross-referenced by the Scottish Executive; In Wales: http://new.wales.gov.uk/topics/health/ocmo/communications/whcs/2007/whc-2007-85/?lang=en; In Wales, health circulars on BBV infections related to healthcare workers are available at: http://www.wales.nhs.uk

Hepatitis C

Guidance on hepatitis C infected health care workers is provided in HSC2002(010). Links to accessing both HSC2002(010) and the accompanying document Hepatitis C Infected Health Care Workers. Department of Health. can be found at: http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Healthservicecirculars/DH_4004561; In Scotland: Hepatitis C Infected Health Care Workers. Available at: http://www.scotland.gov.uk/Publications/2002/11/15811/13927

Info box 1.5: Further guidance and policy on newly employed healthcare workers

New healthcare workers who will perform exposure-prone procedures are required to demonstrate that they are non-infectious for HIV and hepatitis C, and at low risk of transmitting hepatitis B. These clearance checks must be completed before confirmation of an appointment to a post that will require performance of exposure prone procedures.

Health clearance for tuberculosis, hepatitis B, hepatitis C and HIV: New healthcare workers. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_073132; In Scotland: http://www.scotland.gov.uk/Publications/2008/04/25104624/9; In Wales information on BBV screening for healthcare workers is available from http://new.wales.gov.uk

Hepatitis B

37. 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 immunisation. The Department of Health and Scottish Government recommends that all employers ensure that healthcare workers, including students, who have direct contact with blood, blood stained body fluids or patients' tissues, are offered hepatitis B immunisation, with post-immunisation testing of response. Those who receive a primary course of the vaccine should be tested for their immune status 1-4 months post-immunisation, to determine if they require further management if they have not produced an adequately protective response. Management of an exposure incident is discussed in Part 4 of this guidance.

Hepatitis C

38. Transmission of HCV through workplace 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 were fourteen seroconversions between 1997 and 2007. Mucocutaneous exposure has also been documented, where the conjunctival mucosa is contaminated with blood stained body fluids. Although 417 HCV mucocutaneous exposure incidents were reported between 1997 and 2007, none have resulted in seroconversion of UK workers (HPA). 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. Management of an exposure incident is discussed in Part 4 of this guidance.

Further information on BBV transmission is available in Info box 1.6.

Info box 1.6: Further information on occupational transmission of BBV

Occupational transmission of HIV. Summary of Published Reports. Health Protection Agency Centre for Infections and Collaborators. Available at: http://www.hpa.org.uk/webw/HPAweb&Page&HPAwebAutoListName/Page/1191942146589

Health Protection Agency Centre for Infections. Eye of the Needle - Surveillance of Significant Occupational Exposure to Blood Borne Viruses in Health Care Workers; reported bi-annually. Available at: http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1227688128096

Department of Health. Hepatitis B, Chapter 18, Green Book. Department of Health; Recent version available at: http://www.dh.gov.uk/prod_consum_dh/idcplg?IdcService=GET_FILE&dID=115985&Rendition=Web

HPA - Examples of good and bad practice to avoid sharps injuries. At: http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1195733815952?p=1191942146594

Documents of related interest include:
The healthy workplaces handbook - NHS Employers http://www.nhsemployers.org/practice/practice-2468.cfm (subscription only)

The Health Act, 2006. Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_081927

Risk of transmission of blood borne viruses in other occupations

39. 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 contaminated with BBV
- Staff of residential and other accommodation, for those with learning difficulties
- Those handling cadavers and other human remains, such as anatomical pathology technologists (APTs), funeral directors, embalmers and pathologists
- Prison service staff in regular contact with inmates
- Certain members of the emergency frontline services, such as the police, ambulance and fire and rescue services, may require vaccination, but only if

local risk assessment indicates a need, and only if occupational health advice supports this requirement.

40. Local government and sector-specific risk assessments have also identified that the following occupational groups may be at increased risk of exposure to sharps injury and associated BBV exposure. It is therefore recommend that they be considered for immunisation against HBV, should a local, work-related risk assessment and occupational health advice support this:

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

Designated First-Aiders in *any* occupational setting might be at increased risk.

41. Further information on occupational, sector-specific advice and guidance can be found in Appendix 3 of this guidance.