Body fluids and tissues potentially containing BBV

The risk of occupational BBV transmission arises from the possibility of HCWs becoming exposed to blood or, rarely, the following material from an infected patient:

- Amniotic fluid
- Breast milk
- Cerebrospinal fluid
- Dentistry-associated saliva
- Fluid from burns or skin lesions
- Pericardial fluid
- Peritoneal fluid
- Pleural fluid
- Semen
- Synovial fluid
- Unfixed tissue or organs
- Vaginal secretions
- Other visibly bloodstained body fluid

Risk of BBV transmission

- In the healthcare setting, transmission most commonly occurs after percutaneous exposure to a patient’s blood by ‘sharps’
- ‘Sharps’ are needles, sharp-edged instruments, broken glassware or any other item contaminated by blood or body fluids which may cause lacerations or puncture wounds; bone fragments or teeth may also pose a risk

- The risk of infection following a percutaneous exposure is
  - ~ 1 in 3 if source patient is HBV positive
  - ~ 1 in 30 if source patient is HCV positive
  - ~ 1 in 300 if source patient is HIV positive

- Factors associated with a higher risk of occupationally acquired HIV infection are
  - Deep penetrating injury
  - Visible blood on the device that has caused the injury
  - Injury with a needle which had been placed in source patient’s artery or vein
  - Terminal HIV-related illness in the source patient

- Mucocutaneous exposure occurs as a result of contamination of the mucous membranes of eyes, mouth or nose or of broken skin with infected blood or other infectious material
- BBVs are potentially transmissible by human bites through mucous membrane exposure if the bite breaks the skin of the person bitten. NB: In this scenario both parties are a potential source of BBV infection.

- The risk of infection following a mucocutaneous exposure is
  - ~ 1 in 1000 if source patient is HIV positive
  - unknown if source patient is HCV positive
  - unknown if source patient is HBV positive

- There is no evidence that BBV can be transmitted by blood contamination of intact skin or inhalation, or by faeco-oral contamination
Agent-specific considerations for post-exposure management

a. Hepatitis B virus (HBV)

Healthcare workers will usually have been fully vaccinated against HBV infection, but around 10% of individuals do not respond to the vaccine and, rarely, HCWs might be incompletely vaccinated at the time of a BBV exposure incident.

HB vaccine and HB immunoglobulin (HBIG) are available to provide effective PEP. Consequently, there have been no documented HBV infections following occupational exposure incidents since many years.

Decisions about the appropriate HBV-PEP must take into account the HCW’s HB vaccination history as well as the source patient’s infectivity (HBsAg status).

Details of the appropriate post-exposure interventions are shown in Appendix A. As evident from the table, a dose of HB vaccine (followed by further doses where indicated) is appropriate after virtually every significant exposure incident.

HBIG on the other hand is only required in one of the following two rare situations:
- HCW has received less than two doses of HB vaccine and source patient is known to be HBsAg positive
- HCW is known to be non-responder to HB vaccine and source patient is not known to be HBsAg negative

HB vaccine and HBIG are most effective if given within 48h but should be considered for all HCW attending up to a week after exposure. HB vaccine for out-of-hours use is held in the LRI Emergency Department. Hepatitis B Immunoglobulin (HBIG) can be accessed only via the Microbiology duty doctor.

If the source patient’s HBsAg status is confirmed as positive or remains unknown, HCW HBsAg testing at three months after exposure will rule out or confirm seroconversion (infection).

b. Hepatitis C virus (HCV)

Neither vaccination nor other effective PEP is currently available and HCV therefore currently poses the greatest occupational BBV infection risk. 14 HCV seroconversions in HCW have been reported in the UK between 1997 and 2007. [4] Post-exposure management is aimed at early detection of seroconversion and, if observed, referral for specialist assessment.

In seroconverters who have not cleared the virus after two to four months, treatment with pegylated interferon with or without ribavirin for at least six months has been shown to lead to HCV clearance. [5]

If the source patient’s HCV status is confirmed as positive or remains unknown, HCW HCV testing over the course of 6 months after exposure will rule out or confirm seroconversion (infection). Details of the appropriate testing schedule are shown in Appendix B.
c. Human immunodeficiency virus (HIV)

Following significant exposure incidents involving HIV positive source patients (or patients in whom a clinical diagnosis of an AIDS-defining illness is made) a 28-day course of HIV-PEP using a combination of antiretroviral medications active against HIV infection should be given. HIV-PEP is effective: There have been no new documented cases of HIV seroconversion due to percutaneous occupational exposure since 1999. [4]

To ensure optimum efficacy, every effort should be made to commence HIV-PEP as soon as possible after the incident - ideally within the hour. Nevertheless, HIV-PEP should be considered for all HCW attending within 72h and, rarely, up to two weeks following exposure.

In practice, the source patient’s HIV status is often unknown at the time of exposure. In that situation, an antiretroviral ‘starter pack’ can be issued following a preliminary assessment of HIV transmission risk (calculated by multiplying the risk of the exposure by the epidemiological risk of the source patient being HIV positive) and exploration of the HCW’s wishes. If the source patient proves to be HIV negative and test results are obtained and reviewed within 24h, HIV-PEP can be discontinued after no more than 2 – 3 doses and before unpleasant side effects develop.

If it is not possible to identify the source patient (e.g. if the injury is due to a discarded needle) an attempt should be made to determine the epidemiological risk of the source patient being HIV positive, but the use of HIV-PEP is unlikely to be justified in the overwhelming majority of such incidents.

In UHL, 5-day HIV-PEP starter packs containing Combivir (Zidovudine with Lamivudine) and Kaletra (Lopinavir with Ritonavir) as well as Domperidone (for any nausea) and Loperamide (for any diarrhoea) are available from the GUM clinic, OHD on all three hospital sites, IDU, CDU, EMU and the ED. Appendix C shows the information sheet for non-specialist HIV-PEP starter pack prescribers (inserted into every pack for ease of access).

Other drug combinations might be required if the source patient is known to have a drug-resistant HIV infection, or if the HCW is pregnant or taking medications that interact with Combivir or Kaletra.

If the source patient’s HIV status is confirmed as positive or remains unknown, HCW HIV testing at three months after exposure (or three months after HIV-PEP completed) will normally rule out or confirm seroconversion (infection).

A longer follow-up period with additional HIV testing may be indicated in complex cases; e.g. in scenarios involving immunocompromised HCWs or those who experience symptoms compatible with acute seroconversion illness, or source patients with HIV / HCV co-infection.