Blood Borne Virusus
(HEPATITIS A,B,C & HIV)

The term Hepatitis is used to describe inflammation of the liver. Several viruses may attack the human liver but five are relevant here:-
1. Hepatitis A virus
2. Hepatitis B virus
3. Hepatitis C virus
4. Hepatitis D virus
5. Hepatitis E virus

Hepatitis A Virus
Infection is contracted by swallowing the virus. After an incubation period of about three weeks a febrile illness develops. During this stage the virus is excreted in the faeces. After a few days of this illness jaundice appears – by that time virus excretion in the faeces is either undetectable or at a very low level. By the time patients are admitted to hospital they are usually no longer infectious.

Safe handling of the infected patient’s faeces is the most important aspect of controlling transmission of this infection.

Hepatitis B & C and HIV Infection (Blood borne viruses)
Introduction
All health care workers are reminded that they should always follow the basic infection control guidelines and safe working practices to prevent transmission of infection from blood borne viruses (Hepatitis B & C and HIV). Immunisation against Hepatitis B infection is an effective means of protection against this virus but should not be used as a substitute for good clinical practice.
**Hepatitis B Virus**

- Incubation period – 40-180 days.
- Patients remaining HbsAg for more than six months are regarded as having developed the chronic carrier state.
- HbsAg may be found in virtually all body secretions and excretions of patients with acute Hepatitis B and carriers of the virus but blood, semen and vaginal fluids are mainly implicated in transmission of the infection. It is also transmitted peri-natally at or about the time of birth.

**Hepatitis C Virus**

HCV is the major cause of non-A non-B hepatitis. Reported incubation periods range from 20 days to 13 weeks. In the U.K. all blood and organ donations are screened for HCV antibodies. Testing for HCV antibodies has become part of the usual investigations of patients with chronic liver disease.

The virus is transmitted parenterally and there is a high incidence of infection in I/V drug abusers and Haemophiliacs. The virus has also been transmitted via donated organs during organ transplantation. HCV may be present in body fluids other than blood. There is no available vaccine against Hepatitis C.

**HIV Infection**

The virus responsible for Acquired Immunodeficiency (Disease) Syndrome (AIDS) is the Human Immunodeficiency Virus (HIV). It was first isolated in 1983.

**Transmission**

HIV has been isolated from blood, semen, vaginal secretions, saliva, tears, urine, breast milk, cerebrospinal, synovial and amniotic fluid. However, only blood, blood products, semen, vaginal secretions, donor organs, tissues and breast milk have been implicated in the transmission of infection.
There is no documented evidence of the infection being transmitted from saliva, tears or urine nor is there evidence of transmission of infection by faecal-oral airborne spread or transmission through insect bites.

There is good evidence from studies of household contacts of infected people that HIV is not normally spread by close family and social contact.

The known means of spread of HIV are:

- Unprotected penetrative sexual intercourse with an infected person (between men or between a man and a woman).
- Sharing used needles with a person who is infected, i.e. I/V drug abusers.
- Via infected blood transfusion, blood products, donations of semen and organ transplants from someone who is infected
- From an infected mother to her baby (intrauterine or peripartum) or via breast feeding.

**Definition of Body Fluids**

For the purpose of infection control body fluids refers to cerebrospinal fluid, synovial fluid, peritoneal fluid, amniotic fluid, vaginal secretions and semen. Exposure to body fluids such as urine, faeces, nasal secretions, saliva, sputum and vomitus requires no specific precautions for the prevention of transmission of HIV unless these fluids are visible contaminated with blood. However, good general hygiene precautions should always apply and other infection control considerations will often dictate the use of further protective measures.

**Risks to Health Care Workers**

In the health care setting the risk of acquiring the HIV infection is proportional to the prevalence of infection in the population served and the chance of inoculation accidents occurring during procedures. Although the overriding importance of blood as a vehicle for HIV transmission has been emphasised, semen and vaginal secretions must also be regarded as potentially infectious. In
addition tissues and other body fluids, i.e. cerebrospinal fluid, spinal fluid, peritoneal, pleural, pericardial and amniotic fluids should be accorded the same precautions but not faeces, nasal secretions, saliva, sputum, urine and vomitus unless they contain visible blood.

Published information in scientific journals concerning the risk of HIV transmission in the health care setting reveals needle stick injuries and contamination of skin and mucous membranes with blood and body fluids as the cause of occupationally acquired HIV infection. The incidence of HIV infection as a result of a single sharps injury involving blood from a known HIV infected patient is less than 0.4% - the risk of transmission of Hepatitis B virus transmission under the same circumstances is 20%.

**HIV Infection and AIDS**

The human immunodeficiency virus is the primary cause of AIDS and although the precise mechanism of its action is still unclear it apparently destroys a crucial part of the immune defence system so that the body can be overwhelmed by infections that would normally be easily resisted.

AIDS often presents itself as a non-specific illness with fever, night sweats, loss of weight and sometimes diarrhoea. Lymph nodes may become large and swollen. Infection with yeast – Candida may cause persistent and severe thrush in the mouth. Invasion of the lungs by Pneumocystis carinii often gives rise to pneumonitis with shortness of breath and diffuse shadowing can be seen on x-ray.

Many other infections may supervene, i.e. salmonellae, tuberculosis. Some patients develop an unusual tumour of the skin – Kaposi’s sarcoma. This appears as characteristic discrete purple patches after affecting the extremities although internal organs may also be involved.

**Testing for HIV Antibody**

**Consent:** In the clinical setting HIV testing can only be performed with the patient’s explicit consent.

**Counselling:** The patient should be offered counselling preferably by a trained HIV counsellor to ensure that he/she is aware of the implications of a positive or negative result.
He/she should be counselled prior to the test (pre-test counselling) and again after the test whether positive or negative (post test counselling). A person may decline to be tested without positive or negative (post test counselling). A person may decline to be tested without being denied health care.

**Confidentiality:** Patient confidentiality is of paramount importance. Patients infected with HIV/AIDS have the same rights to confidentiality as other patients.

**Responsibility of Health Care Workers to their Patients**

All health care workers are reminded that they have an overriding ethical duty to protect the health and safety of their patients and adopt safer working practices to prevent transmission of Hepatitis B & C and HIV infection.

Those who are or have reason to believe that they may be an infection carrier of Hepatitis B must not perform or assist in exposure prone procedures and must seek immediate medical advice.

Those who have or have reason to believe that they may have been exposed to infectious with HIV in their personal life or during the course of their work must urgently seek medical advice and, if appropriate, HIV antibody testing. If the health care worker is HIV positive and has performed or may be asked to perform “exposure prone” invasive procedures then he/she must cease those activities immediately and seek appropriate medical help.

It is extremely important that an infected health care worker has the same rights of confidentially as any patient.

**Definition of “Exposure Prone” Procedures**

Exposure-prone procedures are those where there is a risk that injury to the worker may result in their blood contaminating a patients open tissues. The procedures include surgical entry into tissues, cavities or organs, repair or major traumatic injuries, cardiac catheterisation, and angiography, vaginal or Caesarean deliveries or other obstetric procedures during which sharp instruments are used, the manipulation, cutting or removal of any oral or perioral tissue, including tooth structure, during which bleeding may occur. Infection might be transmitted where the workers hands (whether gloved or not) may be in contact with sharp instruments, needle tips or sharp tissues (spicules of bone or teeth) inside a patients open body cavity,
wound or confined anatomical space where the hands or fingertips may not be completely visible at all times – this includes the mouth.

Leaking wounds should be well covered with a secure waterproof dressing. Only those parts of the body which are grossly soiled should be washed. The body should be clad in a disposable gown and enclosed in a cadaver bag. (available from Ambulance Control).

**Hepatitis D (Delta Agent)**
The virus requires the presence of the Hepatitis BsAg for successful infection which usually occurs in drug addicts but can also be acquired sexually.

**Hepatitis E**
Otherwise referred to as “enterically transmitted non-A non-B Hepatitis” this infection is common in the developing world where sanitation is poor and waterborne outbreaks occur. It has a high mortality in pregnancy.

**Hepatitis B Vaccination**

**Aim**
To protect both health care workers and patients from Hepatitis B. It applies to those health care workers who perform exposure prone procedures as well as all medical, paramedical, nursing and midwifery staff including students. In addition it applies to non nursing staff engaged in patient care areas, e.g. ward staff, porters and maintenance staff. It applies to permanent and temporary employees. The full course consists of three injections given at 0, 1 and 6 months and the person must be tested one month after the third dose to be sure it has been effective. Provided it is satisfactory, nothing further is required although one may require booster doses in the future as it is not known for how many years protection lasts.
Isolation of Patients
Patients can be nursed in an open ward unless they are bleeding or likely to bleed, have diarrhoea or other infections. Patients with healing wounds, those who have open lesions, a drain inserted or those who are unconscious, un-cooperative, and mentally abnormal and those who are fitting require isolation in a single room, with blood and body fluid infection control precautions.

Collection and Transport of Blood and other Specimens
Venepuncture and other invasive procedures must only be carried out when absolutely necessary for which single use disposable gloves should be worn.

All cuts, abrasions and exudent lesions should be protected with waterproof dressings.

Hands should be washed immediately after gloves are removed.

Blood and other specimens should be collected by trained experienced staff.

Inspect specimen containers for faults before collecting blood or other samples.

Handle specimens carefully ensuring that the outside of the container is not contaminated.

Safe disposal of sharps immediately.

Blood and other specimens are placed individually in biohazard bags with a label on the bag and on the request card.
Procedures where the hands and fingertips of the worker are visible and outside the patient's body at all times, and internal examinations or procedures that do not require the use of sharp instruments are not considered to be “exposure prone” provided routine infection control procedures are adhered to at all times, including the wearing of gloves as appropriate and the covering of cuts or open skin lesions with a waterproof dressing. Examples of such procedures include the taking of blood, setting up and maintaining I/V lines, minor surface suturing.

**Infection Control Measures**

All health care workers should follow these guidelines at all times:-

1. Wash hands regularly between patients and procedures and after removing gloves.
2. Cover wounds or areas of broken skin with waterproof dressings while at work.
3. Health care workers with large areas of broken skin must avoid invasive procedures.
4. Use appropriate protective clothing when splashes of blood or body fluids are anticipated.
5. Protect eyes, mouth and nose from splashes of blood and body fluids.
6. Institute approved procedures for the sterilisation and disinfection of instruments and equipment.
7. Disinfect and clear up spillages of blood and body fluids promptly using approved method.

See also:-

(i) Safe use and disposal of sharps.
(ii) Universal infection control precautions
**Decontamination of Articles and the Environment**

Whenever possible single use disposable equipment and materials should be employed in clinical procedures, particularly if a patient is known or suspected to be infected with Hepatitis (B & C) and HIV.

Equipment used on HIV/AIDS patients need not be dedicated for their sole use, provided it can be safely decontaminated. Thorough washing of equipment before disinfection and sterilisation is essential.

Endoscopes used on patients suspected of having AIDS are disinfected by immersion in 2% gluteraldehyde.

Bedpans/urinals are disinfected in a washer disinfector at a temperature of 80 degrees C for one minute.

For surface disinfection a freshly prepared hypochlorite solution (i.e. Presept 0.1%) is used.

**Laundry and Clothing**

All potentially contaminated linen should be put in a water soluble bag and then to a red polyester bag.

**Waste Disposal**

All waste considered infectious is disposed of in the clinical waste stream for incineration.

**Procedure after Death**

The body should be handled by the minimum number of people required for laying out.

Confidentiality and appropriate infection control measures must be maintained as during life.

Relatives and friends who wish to view the body should be allowed to do so before the last offices are carried out.

Staff who carry out last offices must wear disposable gloves and a plastic apron. Mortuary staff and undertakers must be informed of the danger of infection. All drains, catheters,
intravenous lines, etc. must be removed and disposed of according to hospital policy. Sharps disposed of in sharps container.

**Decontamination of Infectious Spills**
Spills of blood and other body fluids from patients with known or suspected Hepatitis (B & C) and HIV infection should be disinfected and removed as soon as possible. Single use disposable gloves and plastic apron must be worn for dealing with infectious spills. Glass fragments must be picked up with disposable forceps and disposed of in a sharps box. Spills should be disinfected using a hypochlorite – sprinkle liberally with Presept Granules, leave in contact with the spill for two minutes. Wipe up carefully, using disposable paper sheet. Dispose of cleaning materials into clinical waste bag. Wash the area thoroughly using detergent and allow to dry. The gloves and plastic apron are disposed of into the clinical waste stream.

**Surgical Operation**
It may help theatre decontamination if this patient(s) is last on the list but this is not essential. Disposable equipment should be used whenever possible. If any item of equipment is not disposable it must be decontaminated after cleaning by the approved method. Unnecessary equipment should be removed from the theatre in order to reduce the amount of decontamination required after the operation. Disposable drapes should be used and the mattress should be protected by a plastic sheet. Pre-operative shaving of the patient should be avoided if possible. If drainage is considered necessary closed rather than open drainage is recommended. Blood should be cleaned off the patient’s skin as far as possible at the end of the operation and a wound dressing used that will contain exudates with an impervious outer covering. All staff in the theatre should wear a disposable plastic apron under their gowns.
**Maternity Department**

The same precautions for a known or suspected patient are necessary for maternal delivery or Caesarean section as described for surgical operation. (i.e. gloves, plastic apron and eye protection).

The labour ward may be used provided it is adequately cleaned with a freshly prepared hypochlorite, i.e. Titan solution after use.

The placenta should be placed in an approved container and sent for incineration according to the local policy.

Although the risk of transmission of infection to other patients is small, it is advisable to provide the mother and child with a single room post natally. Mothers with HIV/AIDS should be advised not to breast feed.

**Psychiatric Services**

The problems relating to the risks of blood borne infections are not different in the psychiatric setting from those in other units, but they are heightened by two particular aspects of psychiatric work:

The disturbed and violent patient whether or not his mental condition is related to HIV, who creates an increased risk of blood exposure and injury including injury with sharp items.

Sexual activity amongst patients, heterosexual intercourse or sex between men, especially in long stay units.

The measures to be taken by staff are the same as in other units, i.e. care with blood and sharps, avoidance of injuries, covering cuts and open skin lesions with a waterproof dressing.
Safety may be increased by the availability of sufficient staff, e.g. to provide two people for venepuncture injections and adequate staff for restraint of violent patients.