



Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

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Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

1. PURPOSE:

The purpose of this GLP is to set out the good techniques for protection against blood-borne infections in the workplace.

2. INTRODUCTION:

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. The main risk of occupationally acquired blood borne infection relates to viruses that persist in the blood and are known to be endemic in 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. 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. BBVs are mainly transmitted sexually or by direct exposure to infected blood or other body fluids contaminated with infected blood.

3. SCOPE:


3-1- All of the clean room staff in tissue processing center.

4. GOOD TECHNIQUES:

4-1- 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.

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

4-2- Personal Protective Equipment (PPE)

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. When PPE is deemed necessary, consideration should be given to the type of PPE needed, its safe use, maintenance and disposal. Non-disposable PPE, e.g. laboratory coats, overalls or aprons, must be stored appropriately, checked and kept clean and, if faulty, repaired or replaced.

- Uniforms are not PPE as defined by the regulations, but protective clothing such as gown or aprons may be worn over uniforms or normal clothing to control the risk of contamination.
- 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.


4-3- 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 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.
- What procedures to follow in the event of an emergency.

4-4- Handling Incidents/Emergency Planning

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.
- Procedures for cleaning up and disposal of waste.

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

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. In addition, local records should be kept of all such incidents and the underlying cause(s) should be investigated and noted.


4-5- Assessing the risk:

- identify the hazards – where BBVs may be present;
- decide who might be harmed and how – which employees and others may be exposed to BBVs and how this might happen, for example through dealing with accidents or handling contaminated items for cleaning or disposal;
- assess how likely it is that BBVs could cause ill health and decide if existing precautions are adequate or whether more should be done. Factors to consider include:
 - the frequency and scale of contact with blood or other body fluids;
 - the number of different blood/body fluids with which contact is made;
 - any existing information on injuries reported in the workplace;
 - the quality of control measures used;
 - record your findings;
 - review your risk assessment and revise it, if necessary;


4-6- Preventing or controlling the risk in the workplace:

In work activities where there is a risk of exposure to BBVs, the following measures to prevent or control risks apply:

- Prohibit eating, drinking, smoking where there is a risk of contamination.
- Gloves should be worn during any procedure that may result in contact with a blood or other body fluids. Gloves should also be worn when handling needles or other sharp instruments. It has been shown that the volume of blood transmitted by a needle-stick is reduced by 50% when the needle first passes through a glove. For some cases double gloving is recommended.
- The outside layer of gloves should be changed and the dressing applied while the outer pair of gloves is clean.
- In addition to gloves, protective eye cover (not just prescription glasses), masks, gowns and shoe covers should be worn while performing procedures.
- Mouth pipetting or mouth suctioning is strictly prohibited.

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	


- Food and drink are not stored in refrigerators, freezers, shelves, cabinets, bench tops, ovens or microwaves where blood or other potentially infectious materials are kept or may be present.
- All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.
- Leak-resistant containers are used during the collection, handling, processing, storage, transport or shipping of blood or tissue and other potentially infectious materials.
- In high-risk situations (i.e. when contamination is present), sharp instruments should not be passed from hand to hand, but on intermediate trays and should be announced when they are being passed.
- At the completion of the case, the employee should take care not to contaminate areas outside of the work field with blood.
- Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures immediately.
- Protective coverings, such as plastic wrap, aluminum foil, or imperviously-backed absorbent paper used to cover equipment and environmental surfaces, shall be removed and replaced as soon as feasible when they become overtly contaminated.
- All bins, pails, cans, and similar receptacles intended for reuse which have a reasonable likelihood for becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.
- Sharp instruments should always be handled carefully and should not be left unattended in the work field.
- Prevent puncture wounds, cuts and abrasions, especially in the presence of blood and body fluids.
- When possible avoid use of, or exposure to, sharps such as needles, glass, metal etc, or if unavoidable take care in handling and disposal.
- Consider the use of equipment and tools to reduce risk.
- Cover all breaks in exposed skin by using waterproof dressings and suitable gloves.
- Avoid contamination by using water-resistant protective clothing;
- Wear appropriate safety footwear or disposable overshoes when the ground or floor is likely to be contaminated.

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

- Use good basic hygiene practises, such as hand washing. Hand hygiene is the single most important procedure for preventing BBV infections. It is important to note that gloves are not a substitute for hand washing.
- Control contamination of surfaces by containment and using appropriate decontamination procedures. Instruments and other reusable equipment should be appropriately disinfected and sterilized. The work site is maintained in a clean and sanitary condition. Benches and biosafety cabinets are cleaned at the end of the day and after any spill using the disinfectant.
- Dispose of contaminated waste safely. All contaminated materials resulting from a procedure should be placed in appropriate biohazard bags or containers and discarded.
- When removing potentially contaminated gloves it is important to ensure that you do not transfer the contaminant onto your skin. 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. The following pictorial guides show proven methods for correct removal of gloves to minimise the risk of cross-contamination.



Procedure for correct removal and disposal of single use gloves

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

4-7- Decontamination procedures:

HIV can remain infectious in dried blood and liquid blood for several weeks and HBV stays active for even longer. If materials become contaminated with blood or other body fluids, there are several methods available for decontamination. For further information on decontamination of human blood and body fluid refer to **SOP: 07-ver 01** of tissue processing center.


4-8- Disposal of waste:

A risk assessment should be carried out on any waste generated. Certain waste is classified as clinical waste (or biohazard waste) and its collection, storage and disposal is subject to strict controls. Clinical waste includes waste consisting wholly or partly of blood or other body fluids, swabs or dressings, syringes, needles or other sharp instruments, which unless made safe may be hazardous to any person coming into contact with it. For further information on how to dispose of biohazard waste refer to **SOP: 02-ver 01** of tissue processing center.

4-9- Safe handling and disposal of sharps:

Many percutaneous injuries are preventable. Implementation of the following procedures for the safe handling and disposal of sharps will reduce the risks of being BBV infected by cut or needle stick:

- 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. Refer to SOP: 02-ver 01 of tissue processing center.
- Provide sharps containers in adequate numbers and never overfill. Do lock the container when it is three-quarters full. They should be disposed of as biohazard waste after closing securely, and replaced promptly.
- Do not try to press sharps down in the container to make more room.
- Label sharps containers with premises / departmental address prior to disposal.
- 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 hazardous waste bag as it may cause injury.
- Keep all sharps waste in a designated, secure area until it is collected.
- Dispose of disposable razors to a sharps bin immediately after use. Razors should never be re-sheathed after use.
- Do not leave sharps lying around and don't try to retrieve items from a sharps container.

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

- 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.
- Carry sharps containers by the handle - do not hold them close to the body.
- Be careful when re-sheathing needles. Re-sheathing devices can be used.
- Discard disposable blades, syringes and needles wherever possible as a single unit, into sharps containers.
- 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.
- 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.

4-10- Reporting incidents:

Certain incidents and dangerous occurrences must be reported to the supervisor or QC officer. Incidents such as a finger cut, puncture wound from a needle or a surgical blade known to contain blood that maybe contaminated with a BBV should be reported as a dangerous occurrence. Contact the Health service immediately.


4-11- Legal duty of employee?

You have a legal duty to take care of your own health and safety and that of others affected by your actions. You must make full use of control measures put in place.

4-12- Action after possible infection with a BBV:

If you are contaminated with blood or other body fluids, take the following action without delay:

- Wash splashes off your skin with soap and running water;
- If your skin is broken encourage the wound to bleed for a few minutes by gently squeezing around the site, do not suck the wound;
- Wash the wound with soap and water, if they are available, and rinse thoroughly or use individually wrapped cleansing wipes;
- Wash out splashes in your eyes using tap water or an eye wash bottle, and your nose or mouth with plenty of tap water – do not swallow the water;
- Record the source of contamination;

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

- Report the incident to your supervisor or QC officer and ensure that an accident report form is completed.
- If you think you may have been infected, for example through a skin cut or a puncture wound, contact the Health Service immediately.

4-13- Special consideration for first aiders:

The following precautions can be taken to reduce the risk of infection:

- First of all, cover any cuts or grazes on your skin with a waterproof dressing;
- Wear suitable disposable gloves when dealing with blood or any other body fluids;
- Use suitable eye protection and a disposable plastic apron where splashing is possible;
- Wash your hands after each procedure.


As a first aider it is important to remember that you should not withhold treatment for fear of being infected with a BBV.

4-14- Bone and Soft-Tissue grafts:

It has been established that HBV, HCV and HIV can be transmitted through musculoskeletal allografts. Allografts can be obtained from either deceased or living donors.

For deceased donor specimens, a complete social and medical history (including autopsy records if autopsy accomplished) should be obtained to the fullest extent possible. The information obtained should be evaluated for evidence of high-risk behavior and HBV, HCV or HIV infection. Serologic testing for HBsAg, HCV antibody, HIV antibody, (including Nucleic Acid Test (NAT) for HIV and NAT HCV) and syphilis should be performed, as well as multiple microbiologic cultures of the allograft. If this information is unacceptable or cannot be obtained, the tissue must be discarded.

In the case of living donors, donor screening should include a comprehensive social and medical history, physical examination, and serologic testing for HBsAg, HCV antibody, and HIV antibody (including NAT HIV and NAT HCV). Living donors should be interviewed to identify risks associated with HIV infection. Additionally, the donor should sign a patient informed consent statement. The graft should be quarantined during this time and utilized only if the follow-up test results are negative.

Good Laboratory Practices (GLP)	
Department: Regenerative Medicine Research Center	
Doc No: 02	
GLP Title: Protection against blood-borne infections	

4-15- Immunisation:

Immunisation (vaccination) is available against HBV but not other BBVs. The need for an employee to be immunised should be determined by the risk assessment. Vaccinations can be given either by an employee's own GP or the Occupational Health Service

5. REFERENCES:

5-1- Health and Safety at Work Act. Management of Health and Safety at Work Regulations 1999.

5-2- HSE, Health Services Advisory Committee (2003). Safe working and the prevention of infection in clinical laboratories and similar facilities HSE Books ISBN 0717625133.

5-3- 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>.

Final control stamp: