



STANDARD PRECAUTION

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FOREWARD

DIRECTOR GENERAL OF HEALTH MALAYSIA



The HIV / AIDS epidemic has now been known for almost two decades. Since the first HIV cases reported in Malaysia in 1986, there is a relentless increase in the epidemic. Currently, no country is able to stop the epidemic. In the absence of a curative drug or an established effective vaccine, prevention is the best strategy in controlling its spread.

The health care providers are caring for more and more PLWHAs each year. It is the responsibility of each health care personnel to protect themselves from contracting the illness from the patient. In order to do so, it is important that all health care personnel understand standard precautions and apply them whenever they provide cares to PLWHAs.

Therefore the formulation of this “Standard Precautions” guideline for use by health care personnel is most appropriate and timely. It will guide health care personnel in understanding standard precautions and how to protect them from contracting infectious diseases in the line of duty. I hope all health care personnel will make use of this guideline fully for the benefit of themselves as well as others.

I would like to congratulate the AIDS / STI Unit of Ministry Of Health and individuals that have contributed to the development of these important documents.

Thank you.

A handwritten signature in black ink, which appears to read 'M. Taha Bin Arif'. The signature is fluid and cursive.

Datu Dr. Mohamad Taha Bin Arif
Director General Of Health
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The human immunodeficiency virus (HIV) which causes AIDS has brought about a massive epidemic in Malaysia as well as globally. Malaysia currently registers 44,208 HIV-infected individuals and 5,981 AIDS with 4,502 deaths.

Besides individuals who indulge in a high risk activities such as injecting drug users (IDUs) or unsafe sex practices, health care workers are also considered as a vulnerable group for their nature of work. Though the risk of transmission from HIV infected patient to health care worker is low; precautions should not be ignored. Therefore, it is vital that standard precautions be practiced in every health care setting.

Standard precautions are considered the most important strategy for successful infection control in health care setting. They are used for the care of all patients regardless of their diagnosis and perceived infection status. This standard precautions guideline now replaces the previous universal precautions guideline.

It is hope that its references will be useful as tool to promote consistency in the field of universal infection control.

Thank you.

A handwritten signature in black ink, appearing to read 'Tee Ah Sian'.

*Dato' Dr. Tee Ah Sian
Deputy Director General Of Health (Public Health)
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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

Health care workers are at risk of exposure to not only HIV infection but also other infections, which afflict AIDS patients. Transmission of HIV in health care settings can occur from patient to health care worker, between patients, or from health care worker to patients.

The risk to staff arises from:

- sharps and hollow needles;
- splashing of conjunctivae and mucous membranes with contaminated blood and body fluids;
- heavy contamination of broken skin, e.g. cuts, dermatitis etc.;
- handling of large quantities of blood and body fluids without protective clothing.

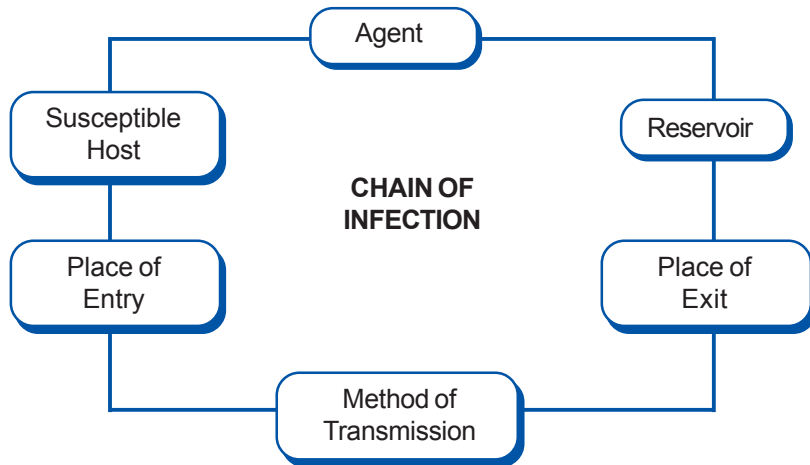
The risk to patients arises from:-

- use of recycled hollow needles and syringes;
- contaminated blood transfusion;
- heavy soiling of the environment;
- poor ward facilities and cleaning

Realizing these risks, infection control measures should be taken to protect patients and health care workers against all sort of infections, which are spread by various routes of transmission.

In order to prevent transmission of disease producing organisms (pathogens) from one person to another, it is vital to understand the chain of infection and factors involved (See Figure 1.1).

Figure 1.1: The chain of infection



Each link in this chain of infection represents an opportunity for the interruption of the process. The links of the chain are defined and described specifically for HIV in Figure 1.2.

Figure 1.2 : The chain of HIV infection

Link in chain	Definition	HIV
Agent	Microorganism which causes infection. Agents include bacteria, viruses, fungi and parasites	Agent that cause HIV infection : Human immuno deficiency virus (HIV)
Reservoir	A place where micro - organisms live, such as in humans and animals, in soils, food, plants, air or water.	HIV live inside humans.
Place of exit	Where the microorganism leaves the reservoir	HIV leave the leaves human body via the penis in semen, vaginal secretions, in blood through breaks in skin and rarely, the breast (breast-milk).
Method of transmission	How the micro-organism travels from place to places	HIV is transmitted via: <ul style="list-style-type: none"> - sexual contact and semen donation; - through blood in use of contaminated needles and syringe; - blood or blood products - from an infected mother to her unborn infant during delivery or shortly after birth

Link in chain	Definition	HIV
Place of entry	Where the microorganism enters the host usually the same way as it left the old host.	HIV enters the host via the penis, vagina, rectal lining, breaks in skin, blood transfusion and rarely breast-feeding
Susceptible Host	A person who may become infected	HIV infection can occur in anyone who has sexual or blood contact with an infected person and in infants of infected mothers.

The following strategies are used to minimise the risk of to HIV / AIDS infections :

- i. Use of Standard Precautions and Additional Precautions as a risk reduction measure
- ii. Modification of risky procedures and use of safety devices to reduce occupational risk.
- iii. Education and retraining

CHAPTER 2

STANDARD PRECAUTIONS AND ADDITIONAL PRECAUTIONS

2.0 HISTORY

Largely due to the HIV epidemic, the Universal Precautions were developed in 1985 to protect essentially health care workers against blood-borne infections through needle-sticks and mucous membrane exposure to contaminated blood and body fluids.

The Universal Precautions applied to all patients regardless of their presumed infection status (this was why the use of the word ‘universal’ in the term ‘Universal Precautions’) and to

- Blood
- Semen & vaginal secretions
- All deep body fluids (amniotic, cerebrospinal, pericardial, peritoneal pleural, synovial fluids)
- Any other body fluids visibly contaminated with blood

But the Universal Precautions did not apply to faeces; nasal secretions; sputum; sweat; tears; urine; or vomitus unless they contained visible blood.

The Centers for Disease Control, Atlanta recommended the use of other isolation precautions beside the Universal Precautions when infections other than blood-borne infections were also diagnosed or suspected.

In 1987, a new system of isolation called ‘Body Substance Isolation’ (BSI) was proposed by a separate group of infection control professionals. The Body Substance Isolation isolated all moist and potentially infectious body substances (blood, faeces, urine, sputum, saliva, wound drainage and other body fluids) from all patients regardless of their presumed infection status primarily through the use of gloves.

The Universal Precautions and the Body Substance Isolation had in common many features designed to prevent onward transmission of infections. However, during their implementation considerable confusion and controversies were created because various hospitals had varied interpretations of these two isolation precautions. As a result a variety of combinations of these two precautions were used. Many health care workers were also unsure of which body fluids required Universal Precautions and Body Substance Isolation. Subsequently, hospitals which were using Universal Precautions were actually using the Body Substance Isolation and vice versa. Some hospitals when implementing the Universal Precautions or the Body Substance Isolation were found not using other isolation precautions for such serious infections as tuberculosis, infections due to multiple-resistant microorganisms and others.

Hence in 1996, the Centers for Disease Control, Atlanta addressed the issue by proposing a new set of guideline and recommended the Standard and Additional Precautions as a two-tier approach to infection control.

This policy now replaces the previous Universal Precautions and reflects the current infection control practices in all health care settings.

1.1 STANDARD PRECAUTIONS DEFINITION

Standard Precautions are considered the most important strategy for successful infection control in the health care setting. They are used for the care of all patients regardless of their diagnosis and perceived infection status. Therefore Standard Precautions apply to all patients who are assumed to be infectious and to:

- blood
- all body fluids, secretions, and excretions except sweat, regardless of whether they contain visible blood
- non-intact skin
- mucous membranes

2.2 STANDARD PRECAUTIONS PRACTICES

Standard Precautions involve work practices which avoid direct contact with blood and all body fluids and guard against needle-stick injuries and exposures to mucous membranes. The infection control practices should include:

- 2.2.1 Hand washing.
- 2.2.2 Appropriate use of personal protective equipment (PPE) including gloves, mask, eye goggles, face shield and gown.
- 2.2.3 Use of disposables and proper cleaning, disinfection and sterilisation of patient-care equipment.
- 2.2.4 Proper housekeeping and management of spillage.
- 2.2.5 Management of soiled/contaminated laundry
- 2.2.6 Disposal of sharps and infectious wastes

2.2.1 Hand washing

Hand washing is a process of removing of transient, potentially pathogenic micro-organisms from the hands and it is a critical factor in the management of patients with HIV/AIDS.

Hands should be washed routinely

- Before and after coming into contact with patient
- When they are contaminated with blood and body fluids
- After removing gloves
- Before and after each patient-care procedure,

Hands should be properly washed following the effective hand-washing technique as shown in Figure 2.1.

Figure 2.1 : Hand Washing Techniques



Palm to palm.



Right palm over left hand and vice versa.



Palm to palm fingers interlaced.



Back of finger to opposing palms with fingers interlocked.



Rotational rubbing of right thumb clasped in left palm and vice versa.



Rotational rubbing, with clasped fingers of right hand in left palm and vice versa.

2.2.2 Appropriate use of personal protective equipment (PPE)

i) Gloves

- a) Sterile surgical gloves should be worn for all surgical and invasive procedures.
- b) Disposable latex/rubber gloves should be worn when touching blood, body fluids, secretions, mucous membranes, non-intact skin, excretions, and contaminated items.
- c) Gloves should be promptly removed after touching these materials.
- d) Change gloves in between procedures and between patient contact.
- e) Gloves should be discarded after a procedure.
- f) Hands should be washed immediately after removing gloves.

ii) *Masks, eye goggles or face shields*

Mask, eye goggles or a face shield should be worn to protect mucous membranes of the eyes; nose; and mouth only when performing patient-care procedures that are likely to generate splashes of blood, body fluids, secretions and excretions. Examples of such procedures are irrigation and suction procedures, delivery and dental procedures etc.

iii) Plastic aprons/gowns

A separate disposable apron/gown should be worn for each patient. It is worn to prevent soiling of clothing when performing patient-care procedures that are likely to generate splashes of blood, body fluids, secretions or excretions.

iv) Rubber boots/overshoes

Rubber boots and plastic disposable overshoes may be worn if a large area of floor is grossly contaminated with spillage.

2.2.3 Proper housekeeping and management of spillage

i) Proper housekeeping

There should be a regular cleaning schedule which is diligently adhered to keep the environment clean and safe.

ii) Management of spillage

- a) The spillage should be dealt with as soon as possible.
- b) Disposable latex/rubber gloves should be worn throughout the procedure.
- c) Rubber boots and plastic disposable overshoes may be worn if a large area is grossly contaminated with the spillage.
- d) Freshly prepared Sodium hypochlorite (Chlorox)* 1 : 10 or sprinkle Chloride granules to cover the spillage and left for 5-10 minutes. If it is a large spillage, it may be covered with suitable absorbent material.
- e) The spillage should be wiped up using paper towels or suitable absorbent material. Avoid direct contact between gloved hands and the spillage.
- f) The area should be mopped with Sodium hypochlorite (Chlorox)* 1 : 100.
- g) For a large spill, a mop can be used to wipe instead, but the mop needs to be disinfected with sodium hypochlorite and rinsed thoroughly.
- h) Broken glass pieces should be carefully swept with a broom and discarded into a sharps container.
- i) Equipments used for management of spillage should be decontaminated.

2.2.4 Disinfection and sterilisation of patient-care equipment

- a) Disposable, single-use instruments and items should be used whenever possible.
- b) When reusable items are used, they must be thoroughly cleaned, disinfected and sterilised after each use. However, no special procedures are required in the existing disinfection and sterilisation procedures to deal with the HIV virus. (Refer to Disinfection and Sterilization Policy, KKM 1998).
- c) Safety precautions should be practised in handling sharp instruments at all times.
- d) HIV is readily destroyed by heat at 70-80°C. If autoclaves are not available, reusable items may be disinfected by boiling for 10-30 minutes.

2.2.5 Management of soiled/contaminated linen

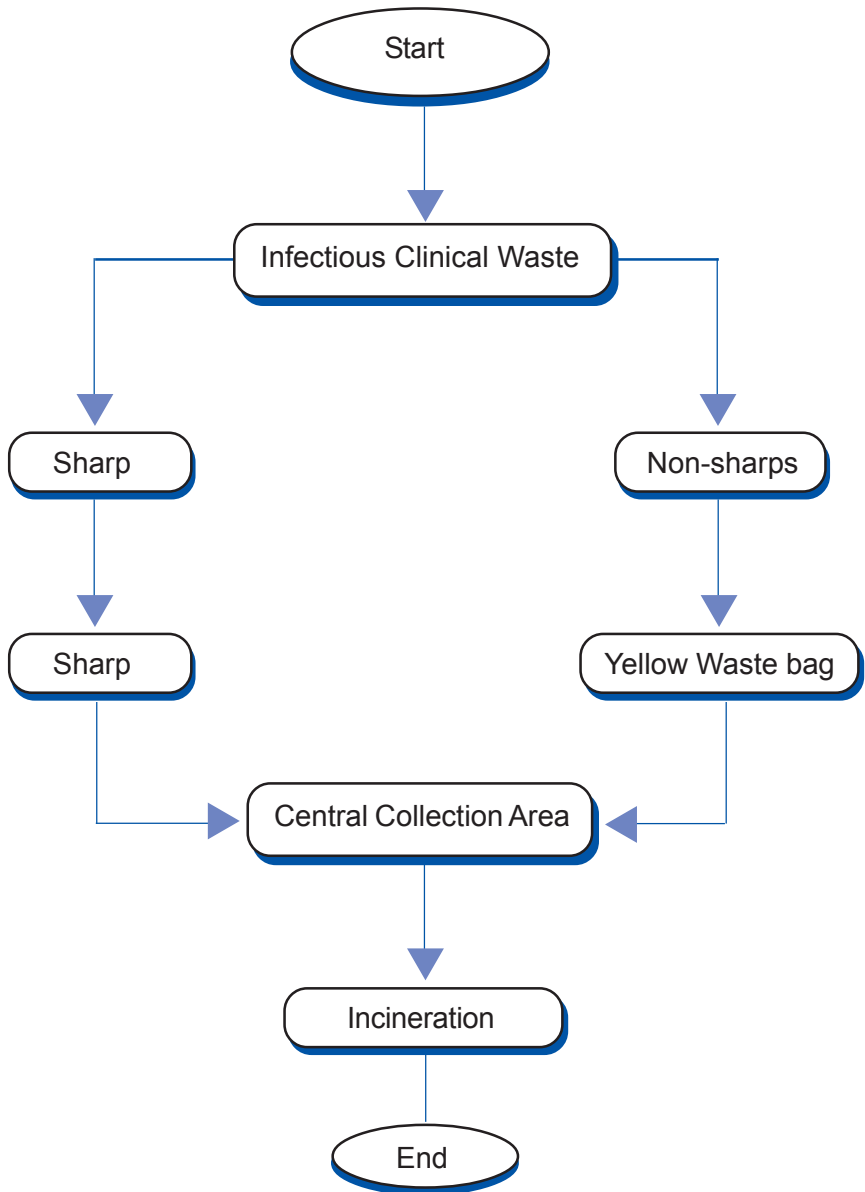
- a) Staff handling ward linen should wear disposable latex/rubber gloves and masks at all times. Handling should be done only when necessary and no sorting is allowed.
- b) Used linen should be placed into laundry bags at site.
- c) Soiled linen soaked with blood or body fluid should be placed into appropriate laundry bags with biohazard label.

2.2.6 Disposal of sharps and infectious wastes

- i) **Disposal of sharps**
 - a) Sharps containers must be placed at the work sites.
 - b) Needles should not be removed from disposable syringes, recapped, bent or broken by hands.

- c) Sharps (loose needles, scalpels, blades, razors, IV administration sets, glass pieces and ampoules) should be picked up with forceps and discarded into sharps containers.
 - d) Sharps containers should not be more than two-thirds full before disposal.
- ii) Disposal of infectious Wastes
- a) Wastes contaminated with blood and blood products (including blood packs) and soiled dressings should be discarded into yellow-coloured bags, ensuring that no leaking of fluid from the bag.
 - b) Excreta and other body fluids should be discarded directly into the toilet or into the sluice that is directly connected to the sewage system.

Figure 2.2 : Flow Chart Disposal Of Infectious Clinical Wastes



2.3 ADDITIONAL PRECAUTIONS

Additional Precautions are used for patients known or suspected to be infected by pathogens that are spread by airborne, droplet, contact or a combined route of transmission. Additional Precautions are used when Standard Precautions alone are not adequate to interrupt transmission. Additional Precautions include Airborne Precautions, Droplet Precautions and Contact Precautions.

2.4 ADDITIONAL PRECAUTIONS - ISOLATION PRACTICES

If HIV/AIDS patients are infected with certain opportunistic infections Additional Isolation Precautions should be used when Standard Precautions alone are inadequate to stop transmission.

2.4.1 Airborne Precautions

Patients known or suspected to have illnesses such as measles, disseminated varicella zoster, active pulmonary tuberculosis which are transmitted by airborne route should be isolated as follows:

i)

Patient placement

- a) The patient should be placed in a single, well-ventilated room, ideally with an attached toilet and bathroom. Well-ventilated room may include an exhaust system leading to the outside. If there is no exhaust system, windows should be kept open.
- b) The room door should be closed at all times.
- c) When single rooms are not available, patients may be cohorted.

ii) **Respiratory protection**

- a) A surgical mask should be worn when entering the room and when doing procedures.
- b) For patient with known or suspected pulmonary tuberculosis, wearing of a well-fitted, high-efficiency particulate air mask or respirator is advisable, mainly during aerosol-generating procedures such as bronchoscopy, tracheostomy, endotracheal intubation, suctioning etc.

iii) Patient transport

- a) The movement and transport of the patient from the room should be limited.
- b) If really necessary to move the patient, a surgical mask should be placed on the patient.
- c) The receiving department should be informed of patient's clinical status.

2.4.2 Droplet Precautions

Patients known or suspected to have serious illnesses transmitted by large particle droplets such as pneumonia due to *Haemophilus influenzae* and *Streptococcus pneumoniae*, streptococcal pharyngitis, influenza, mumps, rubella, Nipah virus etc should be isolated as follows:

i) Patient placement

- a) Ideally the patient should be placed in a single room preferably with attached bathroom and toilet.
- b) If single rooms are not available, patients may be cohorted.
- c) A separation of space of at least three feet between patients should be maintained.

- d) Special air handling and ventilation are not necessary.
- e) The door may remain open.

ii) Respiratory protection

A surgical mask should be worn when working within three feet of the patient.

iii) Patient transport

- a) The movement and transport of patient from the room should be limited.
- b) If movement is necessary, patient's dispersal of droplets should be minimised by masking the patient.
- c) The receiving department should be informed of patient's clinical status.

2.4.3 Contact Precautions

Contact Precautions should be used for patients known or suspected to have serious illnesses due to pathogens easily transmitted by direct patient contact or by indirect contact with items in the patient's environment. Such illnesses include the following:

- Enteric infections
- Skin or wound infections/colonisation with multidrug resistant bacteria such as methicillin-resistant *Staph. aureus* (MRSA); multidrug resistant gram negative organisms; herpes zoster; MDR TB).
- Viral conjunctivitis.

i) Patient placement

- a) Ideally the patient should be placed in a single room preferably with attached bathroom and toilet.
- b) If single rooms are not available, patients may be cohorted.

ii) Gloves and hand washing

- a) Hands must be washed and disposable, non-sterile gloves are worn before attending to each patient.
- b) Gloves must be changed immediately after having contact with infective materials (faecal material and wound drainage).
- c) Sterile gloves should be worn for invasive procedures.
- d) Gloves must be disposed into clinical waste bin before leaving the patient's environment and hands must be washed immediately with antiseptic soap.

iii) Gown / plastic apron

- a) A clean, non-sterile gown/plastic apron should be worn upon entering the room.
- b) If there is contact with patient, environmental surfaces or items.
- c) when nursing patients with incontinence, ileoostomy, colostomy or wound drainage.
- d) A separate gown/plastic apron should be used for each patient.
- e) Sterile gowns should be worn for invasive procedures.
- f) The gown / plastic apron must be removed before leaving the isolation room.

- g) If possible there should not be any sharing of items or equipment. If unavoidable, the items must be adequately cleaned and disinfected before use for another patient.

iv) Patient transport

- a) The movement and transport of patient from the room should be limited.
- b) If the patient is transported out of the room, the risk of environmental contamination and transmission of micro-organisms to other patients should be minimised by
- bathing the patient and changing his/her clothing
 - changing wound dressing/colostomy
- c) The receiving department should be informed of patient clinical status.

2.5 DISINFECTANTS

Hypochlorites are recommended for surfaces and 2 percent gluteraldehyde for heat-sensitive equipment.

Chlorine compounds are very unstable. Prepare solutions daily or store in a covered brown bottle for up to 30 days. The bottle must be tightly capped between use. Avoid direct sunlight.

General guidance on the use of chemical (disinfection procedures is found in ‘Disinfection and Sterilization Policy and Practice, Ministry of Health, Malaysia. Third Edition 1993’.

Figure 4.3 : Recommended dilutions of chlorine-releasing compounds

“Dirty” Conditions	“Clean” conditions (for flooding the contaminated surface prior to removal of bulk material)	(Following physical removal of bulk material)
Available Chlorine (required dilution)	0.5% (5 g/litre, 5000 p.p.m.)	0.05 -01% (1 g/litre, 500 -1000 p.p.m.)
Sodium hypochlorite solution (5% available chlorine)	100ml/litre	10 - 20 ml/litre.
Calcium hypochlorite 70% available chlorine	7.0 g/litre	0.7 -1.4 g/litre
Sodium dichloroiso- cyanurat (NaDCC) (60% available chlorine)	8.5 g/litre	0.9 -1.7 g/litre
NaDCC - based tablets (1.5 g of available chlorine per tablet)	4 tablets/litre	1/2 - 1 tablet/litre
Chloramine (tosylchloramide sodium, chloramine T (25% available chlorine)	20 g/litre	10 - 20 g/litre *

* Chloramine releases chlorine at a slower rate than dichlorohydrates. Therefore a higher available chlorine concentration is required in chloramine solutions for the same effectiveness. Chloramine solutions are not inactivated by biological materials (e.g. protein and blood) thus a similar concentration is recommended for both clean and dirty conditions.

2.6 INTRAVASCULAR PROCEDURES

These must be performed with great care by an trained personnel:

- a) Gloves should be worn.
- b) Use additional protective equipments if necessary.
- c) A closed system (Vacutainer) is recommended but if a hypodermic needle and syringe must be used the whole unit must be discarded in a sharps container at work site. **DO NOT RESHEATH NEEDLES.**
- d) Cannulae, hypodermics and Vacutainers with retractable needles are available for use on high-risk patients. Although these are expensive and cumbersome to use, they greatly reduce the risk of needle-stick injuries.
- e) For interrupted infusion, the end of IV giving set should be kept covered with stopper instead of needle.
- f) Use intravenous stopper after taking blood gaseous instead of capped needle.

2.7 *COLLECTION AND TRANSPORTATION OF BLOOD FROM PATIENTS*

- a) Collect specimens (using a closed system, see above) in secure containers, label clearly and put in a leak-proof bag with request form. (Venepuncture should only be performed by an trained personal. Double gloves may be worn and a disposable plastic sheets should be placed beneath the patient's arm to reduce contamination from accidental blood spillage).
- b) Any gauze or soiled paper towels should be discarded in the clinical waste bag.

- c) Transferring the blood to an appropriate container should be done slowly and carefully and without creating an aerosol.
- d) Needles should not be resheathed but discarded in the sharps container. However, if resheathing is absolutely necessary, use a mushroom device, which holds the cap so the needle can be introduced safely. Alternatively, lay the cap on the table with the closed end against anything that offers resistance and insert the needle carefully - NEVER hold the cap while resheathing.

CHAPTER 3

STANDARD PRECAUTIONS IN SPECIFIC HEALTH FACILITIES

3.0 INFECTION CONTROL PRECAUTIONS FOR HEALTH CARE WORKERS

The following infection control precautions applied for all health care workers in hospitals as well as health clinics setup.

3.1 In general wards

- a) Wear gloves and disposable aprons / gowns when handling blood and body fluids. Wearing of double gloves is recommended when performing oral care.
- b) Cover cuts, abrasions or any type of skin lesions with a waterproof dressing and wear gloves when caring for patients. Health care workers with eczema or severe skin lesions should not deliver care to HIV/AIDS patients.
- c) Use disposable sets and items as far as possible.
- d) Keep equipment and staff to a minimum when nursing HIV/AIDS patients. Carry out routine environmental cleaning with water and detergent.
- e) Properly dispose off all soiled dressings, swabs, syringes and sharps into appropriate clinical waste bags & sharp containers.
- f) Give patients individual thermometers and other personal hygiene sets.
- g) Wipe thermometers with 70% alcohol and store dry.

- h) Staff assisting in procedures likely to generate splashes should wear eye goggles and masks.
- i) Only qualified and trained health care workers are allowed to take blood specimens from HIV/AIDS patients. Seek assistance when dealing with uncooperative, restless and confused patients.
- j) Collect blood and body fluid specimens in securely sealed containers to prevent leakage during transportation.
- k) Use disposable resuscitation devices if available. If unavailable the item must be adequately cleaned and disinfected before using it on other patient.
- l) Isolate patients according to Airborne, Droplet or Contact Precautions when required.
- m) Patients with HIV infection do not require any disposable or separate eating/drinking utensils. These can be washed with hot water and detergent.
- n) Patients with severe mouth infection, pulmonary TB or an enteric infection may use their own crockery, kept in the isolation room.
- o) Handle laboratory specimens as follows:
 - Collect specimens into appropriate containers with tight-fitting lids to prevent leakage.
 - Transport specimens with care to the laboratory as soon as possible.

3.2 In Intensive Care Unit

- a) Health care workers in the Intensive Care Unit should adhere to Standard Precautions at all times and use appropriate Additional Precautions when applicable.
- b) Wear disposable plastic apron/gown, masks and eye goggles during procedures that are likely to generate splashes of blood or body fluids.

- c) Wear separate disposable plastic apron/gown when attending to each patient.
- d) Wear sterile double gloves when performing aseptic invasive procedures.
- e) A sharps container should be available on every procedure trolley. Discard all sharps into the sharps container immediately after use.
- f) When possible, use self-sheathing needles, cannulae and other safety devices.

3.3 In labour room

The following infection control procedures are recommended for health personnel attached at labour rooms either in hospitals or Alternative Birth Centers (ABC).

- a) All HIV positive mothers should deliver in the hospital for proper management.
- b) Health care workers who perform vaginal deliveries and manual removal of placenta should wear elbow-length latex gloves and long-sleeved disposable plastic gown. For Caesarean section, wear a plastic apron beneath the sterile surgical gown.
- c) Wear disposable latex / rubber gloves when handling placenta, the newborn and the umbilical cord.
- d) Handle placenta as follows:
 - i) *For Health Care Worker*
 - Wear plastic apron and double gloves when examining placenta.
 - Avoid splashes.

ii) *For Muslims*

- Place placenta in sodium hypochlorite 1:10 for 10 minutes.
- Drain out and carefully seal in double plastic bags before handing over to relatives.
- Provide relatives with two pairs of disposable latex/rubber gloves.
- Educate them on safe handling of the placenta at home.
- If the Muslim relatives do not wish to take the placenta home, discard as clinical wastes.

iii) *For Non-Muslims*

- Discard as clinical waste.
- e) Discard all disposable contaminated items into yellow bags for incineration.
- f) Wear disposable latex / rubber gloves and plastic aprons when handling baby and umbilical cord after initial handling and examination.
- g) Wear disposable latex / rubber gloves and plastic apron for any further procedures involving body fluid eg. Changing sanitary towel.
- h) The mother should sit or lie on disposable incontinence pad on the wheel chair or stretcher during transfer to the postnatal wards.
- i) Discard all linen stained with blood and liquor into appropriate bag for soiled linen.
- j) Disinfect delivery bed by wiping with sodium hypochlorite 1:10 and then wipe dry.

- k) Post-natal infection control measures
 - i) Wear gloves and plastic aprons for any procedures involving blood or vaginal secretions.
 - ii) Ensure minimal handling of contaminated materials such as underwear and sanitary towels.
 - iii) Wash hands thoroughly after examination.
 - iv) Discard all linen that is stained with blood or liquor into appropriate linen bags before sending to laundry.
 - v) Discard all used sanitary towels and disposable items into clinical waste bags for incineration.
 - vi) Educate patient on good hand and personal hygiene.

3.4 In the Accident and Emergency (A&E) Department / Treatment Room / Operation Theatre / Dental Clinic

The following infection control procedures are recommended for all personnels in Accident And Emergency (A&E) department, treatment room, operation theatre, day care surgery and dental care and surgery.

- i) ***Before procedur / surgery***
 - a) Schedule known HIV/AIDS cases last in the operation list .
 - b) Use waterproof, disposable drapes; disposable gowns; anaesthetic masks; and circuits for all cases.
 - c) Avoid pre-operative shaving. Depilatory cream can be used if available.

ii) *Personal Protection Equipment (PPE)*

- a) Wear sterile double gloves during any surgical procedure involving penetration of skin, mucous membrane and/or other tissues.
- b) If a glove is torn, replace it when patient's safety permits. Wash hands immediately after removal of gloves.
- c) Wear eye goggles and masks, or face shields during procedures that may result in splashing of blood, body substances or bone fragments.
- d) Waterproof aprons/gowns and boots must cover clothing if blood splash is expected.

Iii) Surgical techniques

- a) Identify a neutral zone for sharp instruments, and no hand-to-hand passing of these instruments is allowed.
- b) Encourage the use of magnetic pads for sharps. Surgeons must be responsible for safe placement of sharp instruments.
- c) Never pick up needles with fingers.
- d) Use retractors or swab sticks to increase access into deep tissues.
- e) Cut off suture on atraumatic needle before tying knots to prevent needle stick injury.
- f) Avoid sharp wound retractors such as rake retractors and skin hooks.
- g) Avoid wire sutures for closure of abdomen to prevent injury.
- h) Encourage the use of blunt needle suturing to close the chest and abdomen. The use of skin staplers is useful for final skin closure.

- i) No washing of used instruments is to be done in OT. They should be done mechanically in the CSSD.
 - j) Use closed wound drainage systems.
 - k) Dress surgical wounds with a waterproof outer dressing to contain wound exudate.
 - l) Attend to all needle-stick and mucous membrane exposures immediately according to standard protocol at the work place.
- iv) **Emergency Surgical Procedure**
Apply all standard precautions measures.

v) Terminal Disinfection Of The Operating Room And Instruments

Carry out terminal disinfection of the operating room and instruments according to standard protocols and no additional precautions are required. (References required for Operating Room And Instruments Disinfection)

3.5 Renal dialysis unit

The same basic principle apply to the dialysis unit as to the operating theatre and delivery room:

- a) Staff should be immunized against hepatitis B before starting work in the unit.
- b) All patients should be screened and immunized against hepatitis B.
- c) Disposable tubing and heat-labile equipment are recommended for dialysis.
- d) The outer surfaces of the renal dialysis machine should be cleaned with warm water and detergent.
- e) The inside of the machine should be cleaned with 1 per cent chloro (hypochlorite) and rinse thoroughly before further use.

- f) Disposable filters should be used to prevent contamination with blood.
- g) Disposable administration lines, dialyser and needles should be used.
- h) Equipment to be recycled should be able to withstand autoclave temperatures of 121°C.

3.6 Services outside the health premises (eg: School health services / Mobile clinic / Health Camps etc)

All standard precautions as above applies.

- a) Sharp bin must be brought to the field and place near the working area.
- b) All used sharps should be placed in the sharpbins.
- c) Needles should not be removed from disposable syringes, recapped, bent or broken by hands.
- d) All clinical wastes must be placed in the yellow plastic bags and ensure that there is no spillage.
- e) The yellow plastic bags must be securely tied before bringing it back to the clinic for disposal.
- f) All contaminated linen must be placed in the plastic bags and tied securely before bringing it back to the clinic. At the clinic wash the linen with running water and soaked it with sodium hypochlorite for 30 minutes. Then launder as usual.
- g) If a needle-stick injury occur, guideline on management of occupational exposure should be adhered strictly.

CHAPTER 4

STANDARD PRECAUTIONS FOR LABORATORY SERVICES INCLUDING BLOOD TRANSFUSION CENTRES

4.0 INTRODUCTION

Laboratory safety and infection control procedures are important to protect the staff and minimize accidental exposures to potentially infectious materials. Standard laboratory rules pertaining to safety and hygiene must be adhered to at all times when handling clinical specimen and in preventing exposures to HIV and hepatitis via blood / body fluids.

4.1 NEWLY-EMPLOYED HEALTH CARE WORKERS

- a) All new staffs in the healthcare setting should be trained in standard precautions and laboratory safety procedures.
- b) They should be screened for Hepatitis B and given the appropriate vaccination if necessary.

4.2 EMERGENCY MEASURES FOLLOWING EXPOSURE TO BLOOD / BODY FLUIDS

- a) The emergency equipment (e.g. First aid box, wash basin, eye wash fountain) should be available and easily accessible.
- b) Accidents such as cuts, needle sticks injuries and skin abrasions with instruments possibly contaminated with blood should be reported promptly to the Superior officer / Safety Officer and Head of unit for immediate management and follow-up.
- c) First aid should be administered immediately. If there is a wound/cut, squeeze out the blood and wash with plenty of water and soap. The eyes and mouth are washed and rinsed with water if the face had been splashed with blood.

- d) The sharp injury / accident is documented including details of exposure to blood and blood products.
- e) Blood from injured healthcare worker and the source (if known) should be tested for Hepatitis B, Hepatitis C and HIV.
- f) The staff is referred for further management, counseling and follow-up.

4.3 PROTECTIVE CLOTHING

- a) Laboratory coats/gowns/aprons should be worn at all times when handling potentially infectious clinical specimens and laboratory materials, and removed when leaving the laboratory. For procedures in which splashes may occur e.g. in the washing room, impermeable plastic apron is recommended.
- b) Wear disposable gloves when handling all clinical specimens. Remove gloves when answering the telephone, performing written work and on completion of work.
- c) Wear mask, eye goggles or face shields if splashes or aerosols are likely to be generated such as in activities of blending, sonicating and vigorous mixing. Carry out these activities in a biological safety cabinet.
- d) Contaminated laboratory coat, gown, and other protective clothing should be soaked with sodium hypochlorite 1:10 for at least 30 minutes before washing with detergent and water.

4.4 HANDWASHING FACILITIES

- a) Sinks for washing hands should be available and located at the exit / entrance of the laboratory.

- b) Adequate liquid soap and paper towels should be provided. Antiseptic detergents containing chlorhexidine may be supplied for washing hands contaminated by infectious materials.

4.5 GENERAL PRECAUTIONS

- a) All workbenches and laboratory environmental surfaces (including drawers) should be made of smooth, non-porous material (e.g. Formica) and able to withstand regular disinfection.
- b) Workbench tops should be regularly wiped with 0.5% sodium hypochlorite.
- c) The specimens for which special measures must be taken are blood, serum, unfixed tissue and body fluids. Urine, saliva and faeces without overt blood staining present minimal risk. Specimens should be kept in a 'dirty area' of the laboratory.
- d) Separate clean areas should be designated for books, forms and reports.
- e) Serum, plasma and similar specimens should be preferably centrifuged in sealed buckets with translucent caps. If a breakage occurs in a centrifuge, the procedure should generally be abandoned, the centrifuge decontaminated by chemical disinfection and the buckets by autoclaving. Trained and informed staff wearing suitable protective clothing, as directed by the head of unit may salvage important unrepeatable specimens. It is not necessary to open the centrifuge buckets in a safety cabinet.
- f) Centrifuge buckets should be routinely disinfected at the end of the day and immediately when soiled.
- g) Decontaminate any equipment that has been contaminated with blood or other body fluids with sodium

hypochlorite, or autoclaved, whichever is suitable and according to the manufacturer's recommendation.

- h) Hands should be washed with soap and water after removing gowns and gloves, before leaving the laboratory and at any time after handling material known or suspected to be contaminated.
- i) Mouth pipetting of any substance is strictly prohibited. Use mechanical pipetting devices for manipulating all liquids.
- j) Do not recap needles and syringes to prevent needle-stick injuries.
- k) All **Pan Jets** must be decontaminated every morning by boiling for 15 minutes. If contaminated by blood, it is to be cleaned and boiled before using.
- l) For laboratories specializing in HIV investigation, the laboratory door should be close and access is restricted.

4.6 COLLECTION, DESPATCH AND RECEPTION OF SPECIMENS

- a) All staff should be trained on safety and infection control measures regarding sharp injuries, blood and body fluid exposures.
- b) Specimens must be collected in robust screw-capped and leak-proof containers, which will stand upright. They should be properly labeled on both the specimen containers and request forms.
- c) Blood specimens from patients with HIV/AIDS should be sent to the laboratory by porters (and not via the pneumatic tube transport system).

4.7 CHEMICAL PATHOLOGY / HAEMATOLOGY

- a) Tests should wherever possible be confined to those which can be performed in an enclosed system, e.g. automatic analyzer.
- b) If the apparatus requires servicing, preliminary disinfection of the entire system will be necessary.

4.8 HISTOPATHOLOGY

- a) The usual methods of fixation of tissue and smears are satisfactory for the inactivation of HIV.
- b) Wherever possible, tissues should be received in the laboratory as small specimens in fixative. For small biopsy specimens, 6-8 hours in formaldehyde solution would suffice and this time interval should satisfy most diagnostic needs. When a more rapid result is required, other methods of fixation, such as the use of heated formaldehyde solution, may suffice. No special precautions need be taken with fixed specimens.
- c) Post-mortem examinations are carried out for medico-legal purposes or clinical reasons at the medico-legal discretion of the Pathologist.

4.9 MEDICAL MICROBIOLOGY

- a) Clinical specimens, which appear to have leaked, should not be processed. If another specimen could not be obtained, then the processing of this specimen should be left to the discretion of the Medical Microbiologist.
- b) Laboratory discard jars should be provided daily with freshly prepared 0.5% (1:10) sodium hypochlorite.

4.10 WASTE DISPOSAL

- a) Clinical specimens should be properly disposed in clinical waste bags to be sent for incineration. Incineration is the method of choice for disposing of infectious waste. Otherwise they can be decontaminated by autoclaving or chemical disinfection before disposal.
- b) Sharp instrument and needles should be put in a puncture-resistant container to be disposed by incineration. Needles should not be bent or recapped.
- c) All glassware for recycling should be decontaminated by autoclaving at 121°C for 10 – 20 minutes or heat-treated at 160°C for 1 hour prior to discarding the contents.

4.11 MANAGEMENT OF BLOOD / BODY FLUID SPILLAGE

Blood / body fluid spillage must be managed accordingly as mentioned in Chapter 2 (2.2.3 para ii).

CHAPTER 5

GUIDELIE FOR HEALTH CARE WORKERS

5.0 STAFF PROTECTION AND IMMUNIZATION

- a) All staff working with hepatitis B and HIV patients must be immunized against hepatitis B.
- b) Staff should have adequate training in the care of patients who are HIV or hepatitis B - positive and should be aware of the risks involved.
- c) Clear policies of safety, covering inoculation accidents must be available. All inoculation accidents must be reported and documented.
- d) Frequent lectures are essential to allay fear and promote good morale.

5.1 MANAGEMENT OF HEALTH CARE WORKERS WHO ARE EXPOSED TO BLOOD / BODY FLUIDS DUE TO INOCULATION ACCIDENTS AND MUCOUS MEMBRANE CONTACT

- a) Immediate action by affected health care worker.
 - i) In inoculation accident, squeeze and wash the affected area under running tap water. Dress the wound.
 - ii) If blood/body fluid gets on the skin, wash well with soap and water.
 - iii) If the eyes are contaminated, rinse the area gently but thoroughly with water or normal saline with eyes open.

- iv) If blood / body fluid gets into the mouth, spit it out and rinse the mouth with water several times.
- b) Inform the superior and document the accident using the reporting form.
- c) Seek medical treatment for wound dressing and antitetanus if necessary. Collect 5 ml of blood for HIV, Hepatitis B and Hepatitis C testing from the affected health care worker and the source individual.
- d) Label all blood specimens as 'Urgent Inoculation Accident'.
- e) If the source individual is known or suspected to be positive for either HIV antibody, HBsAg or anti-HCV, refer the affected person to the physician for follow-up and counseling within 4 hours for needle-stick injury and 72 hours for mucous membrane exposure.
- f) Evaluate situation by physician
 - i) Get detailed history from the affected health care worker.
 - Previous risky behaviour.
 - Previous HIV test results.
 - ii) Assess extent of exposure.
 - iii) Assess source patient.
 - History of risky behaviour.
 - Previous HIV test results.
 - History of drug taking.
 - History of taking retroviral drugs.

- Take blood for HIV ELISA test. No consent from the source patient is necessary because of the potential risk to the health care worker. However, inform the patient that the HIV test to be done on him because an occupational exposure had occurred.
- iv) Make prior arrangements with the laboratory in order to get the results within 2-3 hours to allow the physician to decide on the need for early prophylaxis.
 - v) Due to the urgency of the situation, counseling can be done after the blood is sent off to the laboratory.
- g) HIV Post-exposure prophylaxis (PEP)

If an individual is exposed to HIV, it may still be possible to prevent infection becoming established by treating immediately with anti-retroviral drugs. This is known as post-exposure prophylaxis or post-exposure prevention (PEP).

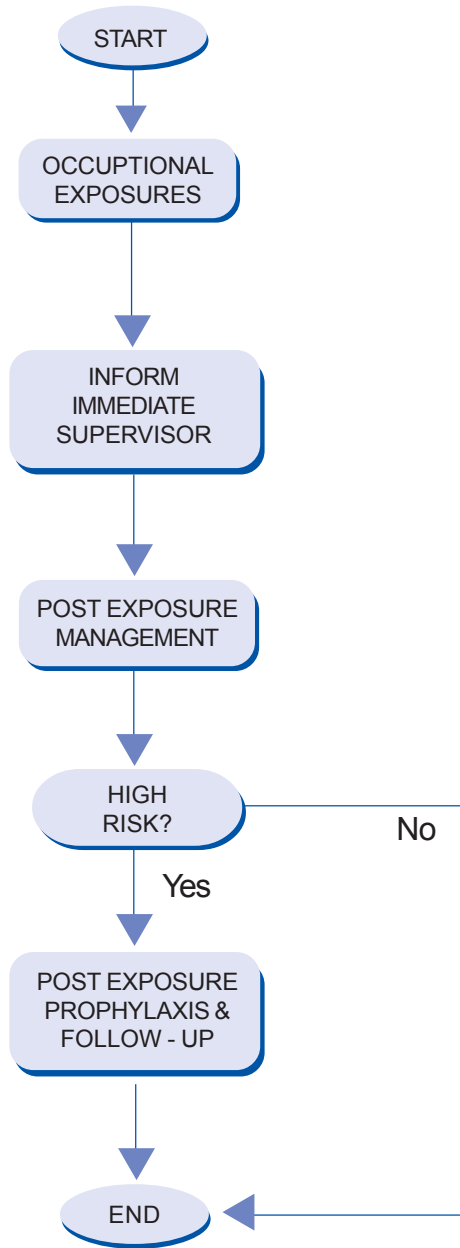
Among those who might benefit from PEP are:

- i) People accidentally exposed to infected blood and body substances in the workplace (cleaning staff, healthcare workers).
- ii) Victims of rape and violence whose assailants are suspected of being infected.
- iii) People who have been potentially exposed because another prevention method has failed.

Based on the available information, zidovudine remains the first drug of choice for PEP regimens. There are no data to support directly the addition of other anti-retroviral drugs to zidovudine to enhance the ef

fectiveness of the PEP regimen. Theoretically, however, a combination of drugs targeting different stages in the viral replication cycle (e.g. NRTIs with a PI) could offer additional protection, particularly for exposures associated with a high risk of transmission.

Figure 5.1 : Flowchart On Management Of Occupational Exposure



5.2 PEP IN HEALTH CARE WORKERS

5.2.1 Prophylaxis

The decision to offer prophylaxis to the exposed health care depends on a number of factors:

- a) Extent of the exposure
- b) Risk of seroconversion
- c) Willingness of the health care worker to be treated
- d) Willingness of the health care worker to be on regular follow-up and monitoring
- e) Regular counseling should be provided to the health care worker irrespective of whether he/she is being treated

5.2.2 Drugs

Currently, the choices of antiretroviral agents to be used for prophylaxis are as follows:

- a) Combination drugs: AZT + 3 TC or 2RTIs + 1 PI (+/- 1 NNRTI)
- b) USPHS Recommendations:
- c) Basic Regime: AZT + Lamivudine (3 TC)
- d) Addition: 1 Protease Inhibitor
- e) Alternative Regime : Lamivudine + Nevirapin

5.2.3 Surveillance and follow-up monitoring:

Follow-up monitoring is essential in all cases of occupational exposures, whether they are tested positive or negative for HIV. Close surveillance to check for seroconversion is important. Ongoing and supportive counseling has to be done on a 'needs basis'.

5.3 Conclusion

Post-exposure prophylaxis is the ultimate measure to prevent occupational HIV infection in healthcare workers and should supplement normal training and precautions for preventing exposures. Although there is lacking in data to show that exposure to HIV-contaminated blood will lead to seroconversion, and post-exposure prophylaxis will prevent seroconversion, it is essential that health care workers be vigilant in their daily work to prevent occupational exposures. It is also necessary that accurate data be kept when an occupational exposure has occurred.

CHAPTER 6

GUIDELINES FOR THE TRANSPORT AND DISPOSAL OF DEAD BODIES DUE TO HIV INFECTION / AIDS

6.0 INTRODUCTION

HIV infection / AIDS is transmitted mainly by sexual contact and through blood and blood products. Therefore it is unlikely that transmission of HIV infection/AIDS can take place while handling dead bodies of patients with HIV infection/AIDS. However, persons handling dead bodies of confirmed or suspected cases should take all possible care to prevent blood, blood products or body fluids from coming into direct contact with their skin and mucous membrane. Those with obvious cuts, burns, open wounds and suffering from immune deficiency states therefore, should not be assigned to deal with the dead bodies. It is important for all health care workers to respect the different religious and cultural practices and traditions concerning the handling of dead bodies.

6.1 *INFECTION CONTROL PRECAUTIONS DURING LAST RITES IN THE HOSPITAL*

Dead bodies of HIV / AIDS patients should be handled just like any other death. However, if there is any oozing of blood / blood products, secretions and excretions of body fluids from the body, broken skin or open wound, persons involved in doing the last rites should practice Standard Precautions.

6.1.1 *Hospital ward*

- a) Notify the District Health Officer and the next-of-kin immediately of the death.
- b) Only minimal handling of the body is allowed:

- c) No packing of orifices.
- d) Change clothing only if soiled.
- e) Wraps body with mortuary sheet and attach identification tag.
- f) Alert mortuary staff before sending the body to mortuary.
- g) Immediately disinfect mortuary cart/stretchers, bed and other fomites that come in contact with the body/body fluids with sodium hypochlorite.
- h) For death in the hospital, it is advisable to do the last rites in the hospital mortuary for infection control reasons.

6.1.2 In the Mortuary

- a) The number of persons involved in handling the dead body should be minimized.
- b) Remove all clothing worn by the deceased and soak in sodium hypochlorite for 20 minutes.
- c) If there is no oozing from the body, it should be handled according to standard last office rites.
- d) If there is oozing from the body, handle as follows:

Wash the body with sodium hypochlorite and then followed by rites of the respective religions. The washing is to be done by representatives of the religious department/relatives under direct supervision of the health personnel.
- e) Carry out cleaning of the oral cavity or other orifices with the use of a sponge holding forceps.

- f) Pack all orifices with cotton wool soaked in sodium hypochlorite.
- g) Wrap the body in cloth soaked in sodium hypochlorite and followed by a layer of plastic.
- h) In the case of a Muslim, use white cloth and further wrap the body twice in white cloth and followed by a layer of plastic.
- i) Disinfect the preparation area and any items that are contaminated or could possibly be contaminated with body fluids with sodium hypochlorite.
- j) If necessary, post mortem of HIV/AIDS patients is allowed as long as the pathologist and his/her assistants practice Standard Precautions including the use of masks and eye goggles/face shields to protect the dispersal of bone fragments.
- k) Embalming HIV/AIDS dead bodies should not be encouraged as it poses danger to the person doing it.

2.2 DEATH IN THE HOUSE

- a) The family of the patient would have been advised to inform the District Health Officer immediately of the death and the nature of the disease. This can be done directly or through the nearest Police Station or Penghulu.
- b) Subsequent disinfection of the body and clothing should be supervised by the Health Inspector / Nurse.
- c) A minimum number of people should be involved with the preparation of the body. It is recommended that not more than 4 people are involved, preferable close relatives.

- d) Health care workers or those who handles the body must make sure that they do not have any cut / open wound. If there is any, they must cover it with waterproof plaster.
- e) The body is similarly disinfected first with sodium hypochlorite and then wrapped as in para 6.1.2 (d).
- f) Water from the washing of the body should be disinfected with chloride of lime.
- g) The patient's clothing, bed, linen, preparation area and areas possibly contaminated by the body fluids should also be disinfected with sodium hypochlorite.
- h) The body could then be buried or cremated according to the respective religious practice within 24 hours.

6.3 TRANSPORT OF A DEAD BODY INTO / OUT OF THE COUNTRY

- a) The legal requirements for the transport into/out of the country of corpses, human remains or bones other than cremated ashes is the same as for other infectious disease. The necessary documents required are the death certificate, embalming certificate, and certificate of import / export or transport.
- b) After the body had been embalmed, the body should then be put in a coffin with an inner lining of translucent polythene of sufficient thickness e.g. 0.26 mm thick and sealed.
- c) The coffin is then placed in a container made of aluminium and sealed.
- d) The outer container for covering or disguising the contents should be of wood or metal that must be of sufficiently solid construction to withstand load stresses.

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