



Guidelines For HIV Infection Control

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OVERVIEW

The human immunodeficiency virus (HIV) is a member of the family of retroviruses. Another member of the family called the human immunodeficiency virus type 2 (HIV 2) has been isolated from patients with AIDS-like disease in some West African countries. HIV is present in the blood and body fluids of an infected individual whether he/she has symptoms or asymptomatic.

Transmission of HIV could occur through infected blood or tissues, body secretions that may contain the virus such as semen, vaginal fluid and breast milk.

The following are the main modes of transmission

1. Sexual Contact

Sexual transmission is the most frequent mode of transmitting HIV. The virus can be transmitted from an infected person to his or her sexual partner (man to man, man to woman, and woman to man). HIV transmission from woman to woman may also occur. To avoid sexually acquired infection, people must take very specific steps.

2. Exposure To Infected Blood or Blood Products

transmission occurs through the transfusion of infected blood or blood products, or through the use of contaminated needles, syringes, or other skin-piercing instruments. The risk of acquiring HIV infection is related to the size of the inoculum, recipients of a single unit of HIV-infected blood have virtually a 100% probability of acquiring infection.

Transmission through blood transfusion is a significant problem in countries that have not yet established nationwide HIV antibody screening facilities for blood donors. Transmission through contaminated needles and syringes is specially significant problem among intravenous drug users and where needles and syringes are not sterilized before reuse.

3. Perinatal Transmission

Prenatal transmission may occur before, during or shortly after birth. The overall risk of HIV transmission from an HIV-infected mother to her infant is about 50%. Infection has been reported in infants delivered by caesarean section. Postnatal transmission (probably through breast milk) has been described in infants exposed to mothers who acquired HIV infection after delivery.

HIV Is Not Transmitted by the following

- Ø respiratory or enteric routes
- Ø person to person contact in the home or in a public setting
- Ø Insects bite
- Ø Food
- Ø Water
- Ø Toilets
- Ø swimming pools

- Ø sweat, tears
- Ø sharing of food or drinking utensils
- Ø telephones
- Ø second-hand clothing

Risk of HIV transmission in the health care setting

HIV can be transmitted in the following ways

To patients

through contaminated instruments that are re-used without adequate disinfection and sterilization; transfusion of HIV-infected blood, skin grafts, organ transplants; HIV-infected donated semen; and contact with blood or other body fluids from an HIV-infected health care worker.

To health care workers

skin piercing with a needle or any other sharp instrument which has been contaminated with blood or other body fluids from an HIV infected person; exposure of broken skin, open cuts or wounds to blood or other body fluids from an HIV infected person; and splashes from infected blood or body fluids onto the mucous membranes (mouth or eyes).

for health care workers to protect themselves from HIV and other blood borne infections, is to consider all patients to be infectious unless there is a medical opinion to the contrary. Application of the principles of infection control is a vital part of effective day –to-day nursing practice

1 . Hand Washing

Hand and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids, to which universal precautions apply for potentially contaminated articles. Hands should always be washed after gloves are removed even if the gloves appear to be intact. Hands should be washed with water and soap

2. Gloves

Always wear gloves when performing any procedure involving contact with body fluids. Gloves protect health care workers from un-noticed cuts in their skin. Treat and handle all blood and other body secretions from all patients as infectious. Therefore, the wearing of gloves and other protective material when handling the above is very crucial. a strongly advised to avoid direct patient contact until the lesions heal. Nurses should wear gloves of high quality for all direct contact with blood and body fluids. If gloves are not disposable, they should be changed, washed and disinfected or sterilized after each contact with each patient... When gloves are not available, other methods should be used to prevent direct contact with blood; for example, forceps, towel, gauze or if these are unavailable, even a leaf may be employed .

3 . Needles and Syringes

Needles and other sharp instruments e.g. blades, razors, or scalpels should be handled with extreme caution in order to avoid injury. Health care workers should avoid bending needles and all such unnecessary manipulation including recapping . They should avoid putting needles in their pockets. Needles and other sharp instruments should not be thrown into common dustbins since this can be a risk to others. These should be put into separate containers for sharps. It is important to restrict injections and other skin-piercing procedures to situations in which the indications are clearly and appropriately defined. In many situations drugs are given by injection when they would be equally effective if given orally. Reducing the number of unnecessary injections is therefore important in protecting both the health worker and the patient. To avoid person-to-person transmission of HIV, single-use (disposable) instruments should be used once only. To prevent reuse, they should then be destroyed under careful supervision. Multiple-use (reusable) instruments should always be washed and appropriately sterilized (or disinfected) according to existing guidelines. Chemical disinfection must not be used, however, for needles and syringes." If these procedures are always strictly observed, the risk of transmission of HIV through injections and other skin-piercing procedures can be eliminated.

To prevent transmission of HIV-use one sterile needle and one sterile syringe per injection.

5. During procedures in which splashing or sprays of blood occur, e.g. surgery or child birth, the eyes, nose and mouth should be protected

with a face shield or mask and glasses. Gowns and aprons should be worn. Any procedure that involves direct manipulation of a patient's inner tissues and which is likely to generate blood is to be considered invasive. Strict precautions should be adhered to. Gloves and surgical masks should always be worn. All equipment used should be disinfected immediately after being used.

6. Spills of Blood and Other Body Fluids

For spills of blood and other body fluids the contaminated spill area should first be flooded with sodium hypochlorite. The mixed body fluid and disinfectant should then be removed and the surface wiped with disinfectant.

Precautions in Special Areas

1) Mouth-to-mouth resuscitation :

Although HIV has been recovered from saliva, there is no conclusive evidence that saliva is involved in HIV transmission. Nevertheless, to reduce occupational exposure to HIV, mouthpieces, resuscitation bags, or other ventilation devices should be used if available when resuscitation is necessary. Resuscitation equipment should be used once only and discarded, or be thoroughly cleansed and disinfected. Mouth-to-mouth mucus extractors should be replaced, if possible, by electrical hand-operated or foot-operated suction machines.

2) Laboratory Specimens:

All specimens should be regarded as potentially infected with a variety of agents including HIV. Sputum, pus, urine, faeces, blood, cerebro-spinal fluid and biopsy specimens must all be handled with great care and containers treated appropriately after examination and before cleaning and disposal. Specimen containers should have secure lids to prevent leakage during transport. All specimens sent to the laboratory should be clearly labeled.

3) Dental Care

Precautions should be taken as for patients with Hepatitis B to ensure both the safety of the dentist and dental assistants and the prevention of transmission of infection from patient to patient especially through the use of needles. Special precautions for dental care include the use of gloves, suction tubing and reservoirs when working inside the mouth and sterilization or disinfection of instruments and other contaminated objects. Masks and protective eyewear should be used particularly when the spattering of blood is likely. Disposable cups for mouth washing are advisable. Otherwise, glassware should always be disinfected adequately or autoclaved after each use.

4) Autopsy, Postmortem procedures

Autopsy procedures for HIV infection do not differ from those that would apply for Hepatitis B or a variety of other infectious diseases. For example, the number of people within the autopsy room should be kept to a minimum and gowns, plastic aprons, gloves and boots used. Extraordinary attempts to disinfect walls and other surfaces are not necessary. Protective eye-wear should be used when opening the cranium or engaging in other activities that could result in risks from aerosols or splashes .

5) Laundry

Linen with no visible soiling can be put together in linen bags along with other linen. Gloves should be worn when handling the soiled linen of all patients. Soak in 0.5% sodium hypochlorite for thirty minutes before mixing with other linen. One should wear a gown if splashing is anticipated. Laundry personnel should treat all linen as infectious and should wear gloves when sorting out linen.

6) Disposal of infected wastes

Needles and other sharp instruments or materials should be placed in a puncture-proof container immediately after use and should preferably be incinerated. Liquid wastes such as bulk blood, suction fluids, excretions and secretions should be carefully poured down a drain connected to an adequately treated sewage system, or disposed of in a pit latrine. Solid wastes, such as dressings and laboratory and pathology wastes, should be considered as infectious and treated by incineration, burning or autoclaving. Other solid wastes, such as excreta, may be disposed of in a hygienically controlled sanitary landfill or pit latrine.

If the precautions described are taken, isolation of HIV-infected patients is not necessary unless they have other infections for which isolation is indicated. Isolate the infection, not the patient.

Disinfection and Sterilization Procedures

All forms of sterilization will destroy HIV.

Sterilization is the destruction of all microbes, including bacterial spores.

High level disinfection is the destruction of all microbes but spores may survive if initially present in large numbers.

Medical instruments that pierce human tissue (e.g. scalpels and needles) must be sterilized between each patient contact. Medical instruments that touch but do not penetrate mucous membranes, (e.g. Anesthesia breathing circuits, vaginal retractors, flexible fibroptic endoscopes), should ideally be sterilized. If this is not feasible, they must receive high level disinfection .

Cleaning

Detergents and hot water are adequate for the routine cleaning of floors, beds, toilets, walls, and rubber draw sheets. Following a spillage of body fluids, heavy-duty rubber gloves should be worn and as much body fluid removed with an absorbent material. This can then be discarded in a leak proof container and later incinerated or buried in a deep pit. The area of spillage should be cleaned with a chlorine-based disinfectant and the area thoroughly washed with hot soap and water.

All soiled linen should be handled as little as possible, bagged at the point of collection and not sorted or rinsed in patient care areas. If possible, linen with large amounts of body fluid should be transported in leakproof bags. If leakproof bags are not available, the linen should be folded with the soiled parts inside and handled carefully, with gloves.

Methods of Sterilization and High Level Disinfection

- Sterilization by Steam (autoclaving)

This is the recommended method for reusable medical instruments including needles and syringes (syringes should be made of glass). The autoclave shall be operated for at least 15 minutes after the load achieves the temperature of 121°C (250°F).

- Sterilization by Dry Heat

Sterilization by dry heat in an electric or gas oven is an appropriate method for instruments that can withstand a temperature of 170°C (340°F). Sterilization time for dry heat is two hours once the load has equilibrated to 170°C (340°F).

- High Level Disinfection by Boiling

A high level of disinfection is achieved when instruments are boiled for 30 minutes. This is the simplest method for inactivating most pathogenic microbes including HIV, Hepatitis B and bacteria, but not spores. Boiling should be used only when sterilization by steam or dry heat is not available.

-High Level Disinfection by chemicals

Chemical disinfection may not be reliable because they may be inactivated by blood or other organic matter present. They may also lose their strength rapidly if they are stored in a warm place.

Chemical disinfection should not be used for needles syringes and other skin-cutting and invasive instruments. They should be employed only as a last resort if neither sterilization nor high level disinfection by boiling is possible.

The two most commonly used high-level chemical disinfectants are glutaral (glutaraldehyde 2% and hydrogen peroxide 6%)

Glutaral (Glutaraldehyde)

This is usually available as a 2% aqueous solution that needs to be activated before use by addition of a powder or a liquid buffer supplied with the solution.

Hydrogen Peroxide

This is a potent high-level disinfectant. Immersion of cleaned equipment in a 6% solution provides high level disinfection in less than 30 minutes.

-Decontamination of Environmental Surfaces with Chlorine Releasing Compounds

Sodium hypochlorite solutions are excellent intermediate to low-level disinfectants. There are many types of bactericidal and virucidal compounds which are inexpensive and widely available. However, these are corrosive for nickel, chromium, steel iron and others

Oxidizable metals

They also deteriorate rapidly in a warm climate. House-hold bleaches contain hypochlorite, and are suitable for use as a disinfectant for HIV.

Disinfection of Living Tissue With Antiseptics

Antiseptics are germicides that are designed for use in living tissue.

Ø Ethanol (Ethyl alcohol) and 2-propanol (isopropyl alcohol) are germicidal for vegetative forms of bacteria, mycobacterium, and are effective against bacterial spores.

For highest effectiveness they should be used in a concentration of approximately 70% (70% alcohol, 30% water).

Ø Polyvidone Iodine is an iodophore and can be used in aqueous solutions.

Ø Formalin is a 37% solution of formaldehyde in water. Free HIV in suspension is inactivated by exposure to 0.5 percent formalin for 10 minutes. Tissues such as biopsy and autopsy specimens are penetrated very slowly by formalin - which may take several days to reach the centre of a tissue block. In histopathology, it is used in a concentration of 10 percent which should be adequate to destroy HIV provided the formalin has penetrated the tissue completely.

Safe decontamination of equipment

Efficient cleaning with soap and hot water removes a high proportion of any microorganisms. All equipment should be dismantled before cleaning. Heavy gloves should be worn for cleaning equipment and if splashing with body fluid is likely, then additional protective clothing such as aprons, gowns, and goggles should be worn. The following table helps in selecting the method for decontamination

| Level of Risk | Items | Decontamination Method |
|---------------|---|---|
| High risk | Instruments which penetrate the skin/ body | Sterilization of single use of disposables |
| Moderate risk | Instruments which come in contact with non-intact skin or mucous membrane | Sterilization, boiling or chemical disinfection |
| Low risk | Equipment which comes in contact with intact skin | Thorough washing with soap and hot water |

Refusal To Care For Patients With HIV Infection

There is no scientific reason why healthy people should be excused from providing care to patients infected with HIV. However, pregnant staff and those who believe they are at high risk of infection because of their own immune status, should discuss their responsibilities with their senior medical officer. Such staff members should be given the option of working elsewhere in the hospital.

HIV infection is commonly associated with an increased risk of infection with organisms such as hepatitis-B, Cryptococcus, mycobacteria, toxoplasma and cytomegalovirus.

Cytomegalovirus infection and toxoplasmosis are of particular concern to pregnant women because of the possibility of fetal damage if these infections are acquired for the first time during pregnancy.

Toxoplasmosis is not transmitted from man to man and, therefore, does not constitute a risk. However, cytomegalovirus may be shed in blood, urine, saliva, semen, breast milk, tears and faeces .

Nurses who have draining skin lesions should not take part in direct patient care and should not handle equipment for patient care.

People known to have antibodies to HIV in their blood must be presumed to be

chronically viremic even though they may be completely free of symptoms. For such viremic persons the following should be observed:

- Detailed instructions should be given concerning the modes of transmission of HIV and the importance of maintaining very strict standards of personal hygiene;
- Cuts and abrasions on exposed parts of the body should be covered when working with a patient;
- Mouth-to-mouth resuscitation should be avoided
- It is not advisable for a health care worker who has a significant degree of immune deficiency to be involved in the care of immune-suppressed persons or those with an immature immune system or patients with an infectious disease (e.g. Tuberculosis and Hepatitis B)
- Health care workers identified as carrying the HIV antibodies should have a complete medical assessment.
- Immune-deficient workers should be advised on the possible risks of live vaccines including BCG for tuberculosis.

Post Exposure Prophylaxis

What it is

Post Exposure Prophylaxis (PEP) is short-term antiretroviral treatment to reduce the likelihood of HIV infection after potential exposure, either occupationally or through sexual intercourse. Within the health sector, PEP should be provided as part of a comprehensive universal precautions package that reduces staff exposure to infectious hazards at work.

Why it is Important

The risk of transmission of HIV from an infected patient through a needle stick where the skin is punctured by a sharp is less than 1%. The risk for transmission from exposure to infected fluids or tissues is believed to be lower than for exposure to infected blood.

The risk of exposure from needle sticks and other means exists in many settings where protective supplies are limited and the rates of HIV infection in the patient population are high. The availability of PEP may reduce the occurrence of occupationally acquired HIV infection in health care workers. It is believed that the availability of PEP for health workers will serve to increase staff motivation to work with people infected with HIV, and may help to retain staff concerned about the risk of exposure to HIV in the workplace.

There is significant debate on the need to use PEP after sexual exposure. The UN offers PEP to its staff in cases of rape when the likelihood of HIV exposure is considered high.

How it is done

The proper use of supplies, staff education and supervision needs should be outlined clearly in institutional policies and guidelines.

Regular supervision in health care settings can help to deter or reduce risk of occupational hazards in the workplace. If injury or contamination result in exposure to HIV infected material, post exposure counseling, treatment, follow-up and care should be provided. Post exposure prophylaxis (PEP) with antiretroviral treatment may reduce the risk of becoming infected.

Prevention of Exposure

Prevention of exposure remains the most effective measure to reduce the risk of HIV transmission to health workers. The priority must be to train health workers in prevention methods (universal precautions) and to provide them with the necessary materials and protective equipment. Staff should as well be knowledgeable about risks of acquiring HIV sexually, and be easily able to access condoms and confidential STI treatment services.

Managing Occupational Exposure to HIV

- First AID should be given immediately after the injury: wounds and skin sites exposed to blood or body fluids should be washed with soap and water, and mucous membranes flushed with water.
- The exposure should be evaluated for potential to transmit HIV infection (based on body substance and severity of exposure).
- PEP for HIV should be provided when exposure to a source person with HIV has occurred (or the likelihood that the source person is infected with HIV).
- The exposure source should be evaluated for HIV infection. Testing of source persons should only occur after obtaining informed consent, and should include appropriate counselling and care referral. Confidentiality must be maintained.
- Clinical evaluation and baseline testing of the exposed health care worker should proceed only after informed consent.
- Exposure risk reduction education should occur with counsellors reviewing the sequence of events that preceded the exposure in a sensitive and non-judgmental way.
- An exposure report should be made.

Providing PEP ARV Treatment

PEP should be commenced as soon as possible after the incident and ideally within 2-4 hours. There is no time limit in most country recommendations, however. Prophylaxis is sometimes given empirically up to 2 weeks in the case of severe exposure when the delay has been unavoidable. Combination therapy is recommended, as it is believed to be more effective than a single agent. Dual or triple drug therapy is recommended.

- The therapeutic regimen will be decided on the basis of drugs taken previously by the source patient and known or possible cross resistance to different drugs. It may also be determined by the seriousness of exposure and the availability of the various ARVs in that particular setting.

Provision of ARV therapy should be provided according to institutional protocol, however (and made available as a PEP “kit”), or when possible, via consultation with a medical specialist. Expert consultation is especially important when exposure to drug resistant HIV may have occurred. It will be important that health care workers have ready access to a full month’s supply of ARV therapy once PEP is begun. A minimum treatment of two weeks and maximum of four weeks is recommended.

Human Resources, Infrastructure and Supplies Needed

Institutional guidelines for PEP should be in place. HIV testing, counselling and antiretrovirals must be made available. It is crucial that effective universal precautions are in place and that an uninterrupted supply of protective materials (gloves, sharp boxes) and safe disposal of hazardous material occurs.

An infection control specialist, staff counsellor, and health care worker trained in HIV/AIDS care are beneficial to ensuring that PEP is provided.

Cost Information

The cost of PEP includes

- Drug costs
- HIV testing costs (of exposed person and source patient)
- Counselling costs (of exposed person and source patient)
- Clinical monitoring, including follow-up and treatment of adverse effects
- Serological follow-up over 3-6 months

PEP for health workers is not considered highly cost effective due to the need to treat a large number of staff to avoid a comparatively smaller number of infections. As the cost of antiretroviral treatments declines, however, cost effectiveness will increase. If providing PEP to health care workers increases staff motivation and assists in staff retention, the cost effectiveness of PEP can be considered to increase significantly. Beyond economic arguments, there are very strong ethical and societal issues for providing PEP following occupational or sexual exposure to HIV.

Training health workers in universal precautions and thereby reducing the incidence of health worker exposure to HIV will be an important step to containing the cost of providing PEP.

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