



SOP FOR MICROBIOLOGY

HOSPITAL INFECTION CONTROL PRACTICES

**LOKOPRIYA GOPINATH BORDOLOI REGIONAL INSTITUTE OF
MENTAL HEALTH, TEZPUR, ASSAM**



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Title :Hospital infection control practices	
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1. Purpose:

Healthcare associated infections (HAIs) are preventable through implementation of best infection prevention and control practices. This will facilitate the delivery of high quality health care for patients and a safe working environment for healthcare workers. These procedures are to provide a co-ordinated approach to the prevention and management of HAIs.

2. Scope:

Guidelines for all working in this healthcare—this includes healthcare workers, housekeeping staff, management and support staff.

3. Responsibility :

- i) Health care workers will work according to this SOP.
- ii) It is the responsibility of the Supervisors to ensure that the SOP is correctly followed at various places.

4. Infection control precautions

4.1: standard precautions:

- ✓ Use of standard precautions is the primary strategy for minimizing the risk of transmission of micro-organisms from both recognized and unrecognized sources of infection in health care facilities.
- ✓ Must be used by all staff, at all times for all patients whether infection is known to be present or not to ensure the safety of those being cared for, as well as staff and visitors in the care environment.

Components of standard precautions

- 1) Hand hygiene,

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- 2) Use of personal protective equipment
- 3) Patient Care Equipment
- 4)Sharps safety
- 4) and
- 5) Respiratory hygiene/cough etiquette.

4.1.1 : Hand Hygiene:

- Hand washing means vigorous rubbing of hand with soap and water or with any antiseptic agents.

Purpose :

- 1)To remove dirt and debris
- 2)To decontaminate the hands
- 3)To prevent cross infection
- 4)To break the chain of infection

“Hand washing is the single most important means of preventing the spread of infection because most common mode of transmission of pathogens is via HANDS” .

✓ **When to wash hands:**

Follow the World Health Organisation (WHO) 5 Moments for Hand Hygiene

- 1)Before direct patient contact.
- 2)Before clean/aseptic procedure.

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- 3)After body fluid exposure risk
- 4)After touching a patient.
- 5)After touching patient surroundings

Indications for Hand Hygiene

- ✓ When hands are visibly dirty, contaminated or soiled, wash with soap and water.
- ✓ If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands . It can be used when hand washing with soap and running water is not possible, as long as hands are not visibly soiled with dirt, blood or other organic material.

Steps of Hand Hygiene using alcohol based hand-rub:

Duration of the entire procedure: 20-30 seconds

Step 1 - Apply a palm full of the product in a cupped hand, covering all surfaces.

Step 2 - Rub hands palm to palm.

Step 3 - Right palm over left dorsum with interlaced fingers and vice versa.

Step 4 - Palm to palm with fingers interlaced.

Step 5 - Backs of fingers to opposing palms with fingers interlocked.

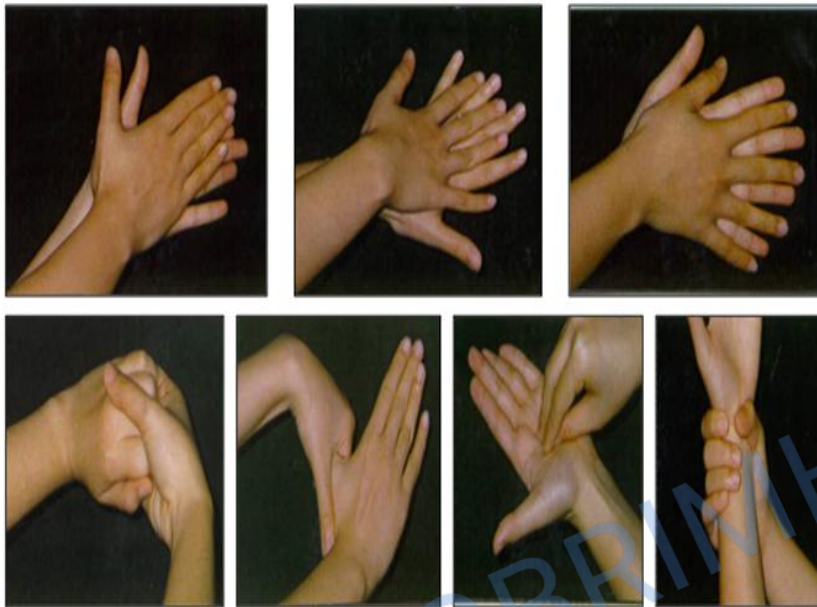
Step 6 - Rotational rubbing of left thumb clasped in right palm and vice versa.

Step 7 - Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa. Once dry, hands are safe.

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Hand Scrub Technique (20-30seconds)



1)Palm to palm,
2)right palm over left dorsum & left palm over right dorsum,
3)palm to palm with finger interlaced
4)Back of fingers to opposing palms with fingers interlocked

5)Rotational rubbing of thumb
6)Rotational rubbing backwards & forwards with clasped fingers of right hand & left palm vice versa
7)Rotational rubbing of right wrist & vice versa then dry thoroughly

hand washing(duration:40-60 seconds)
step1:open the tap,wet your hands and apply hand wash

step2-8:same steps as hand wash

step9:dry the hands with paper towel

step10:close the tap with elbow or by paper towel

Fig 1:steps of hand washing and hand scrubbing

➤ Hand Care:

1. Keep nails clean and short.
2. Remove rings
3. Do not wear artificial or gel nails or nail polish.
4. Remove wrist watches when washing hands .
5. Roll up sleeves to the elbow. Don't use nailbrushes for routine hand

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4.1.2: Personal protective equipment :

- PPE refers to physical barriers, that are used alone or in combination, to protect mucous membranes, airways, skin and clothing from contact with infectious agents to prevent cross-contamination that can occur between the healthcare worker and other patients or healthcare workers, or between the healthcare worker and the environment.
- ✓ **Personal protective equipment should be used by:**
- Healthcare workers who provide direct care to patients and who may come in contact with blood, body fluids, excretions and secretions.
- Support staff including cleaners, and laundry staff in situations where they may have contact with blood, body fluids, secretions, and excretions.
- Laboratory staff, who handle patient specimens.
- Family members who provide care to patients and are in a situation where they may have contact with blood, body fluids, secretions, and excretions.
- The use of PPE should be guided by risk assessment and the extent of anticipated contact with blood, body fluids or pathogens.
- In determining the type of personal protective equipment to use for a given procedure, HCWs should consider the following factors:
 - Probability of exposure to blood and body substances;
 - Amount likely to be encountered;
 - Type of body substance involved;
 - Probable route of transmission of infectious agents

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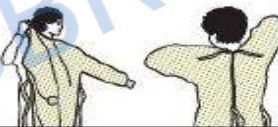



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Personal protective equipment includes:

- Gloves
- Protective eye wear (goggles)
- Mask
- Apron
- Gown
- Boots or shoe covers
- Cap or hair cover


SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

- 1. GOWN**
 - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
 - Fasten in back of neck and waist
- 2. MASK OR RESPIRATOR**
 - Secure ties or elastic bands at middle of head and neck
 - Fit flexible band to nose bridge
 - Fit snug to face and below chin
 - Fit-check respirator
- 3. GOGGLES OR FACE SHIELD**
 - Place over face and eyes and adjust to fit
- 4. GLOVES**
 - Extend to cover wrist of isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene



* In addition to CDC 's sequence for putting PPE, shoe covers when indicated are to be donned first, right before the gown

1A .IMPERMEABLE SHOE COVERS:

- a)Insert both feet into a pair of impermeable shoe cover .
- b)Ensure entire shoe is covered and elasticized cuff is located snugly near ankle
- c)wash hands

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Fig 3: Sequence of donning of Personal protective equipment

4.1.2.1:Gloves :

- a)Gloves shall be worn as an additional measure, not as substitute for hand washing.
- b)Do wear the correct size glove .
- c)Wear gloves when touching blood, body fluids, secretions, excretion,mucous membranes, non-intact skin etc.
- d)Change gloves between tasks and procedures on the same patient after contact with potentially infectious material.
- e)If gloves become torn or heavily soiled and additional patient care tasks must be performed, then change the gloves before starting the next task.
- f) Remove gloves immediately after completion of care or a specified task, Do work from clean to dirty side i.e. touch the clean body sites or surfaces before touching the dirty or contaminated area .
- g) Single-use disposable gloves shall not be washed, decontaminated and reused but disposed off as per waste management policy.
- h)Perform hand hygiene immediately before putting on and after removing gloves

4.1.2.2: Aprons and gowns:

- a)Should be worn by all health care workers when:
 - Close contact with the patient, materials or equipment may lead to contamination of skin, uniforms or other clothing with infectious agents.
 - There is a risk of contamination with blood, body substances, secretions or excretions (except sweat).

4.1.2.3: Facial protection (a medical mask and face shield or goggles):

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- Used when mucous membranes are likely to be exposed to body fluids (or splashes of hazardous chemicals).

Types of Masks

- The tie-back mask, which has four ties to fasten the mask around the mouth and nose.
- The ear-loop mask is similar to the tie-back mask except that it has two elastic bands used for fastening.
- Surgical masks with attached face shields to help provide a protective barrier against splashes and spatters of blood or other potentially infectious material are also available.
- Specialized mask like N95, N99, NBC respirator etc.

Considerations when using a surgical mask include :

- Change masks when they become soiled or never reapply wet masks after they have been removed
- Don't leave masks dangling around the neck.
- Avoid touching the front of the mask while wearing .
- Perform hand hygiene upon touching or discarding a used mask.

Types of Eye Wear

- Plastic glasses with solid side shields
- Goggles
- Masks with clear visors
- Chin-length face shields

4.1.2.4: Caps and boots/shoe covers:

- Wear caps and boots/shoe covers where there is a likelihood that the

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patient’s blood, body fluids, secretions or excretions may splash, spill or leak onto the hair or shoes.

- Launder caps and shoe covers appropriately if they are reusable, according to the hospital guidelines.
- Do not reuse disposable caps/shoe covers. They should be discarded according to the health care facility protocol.
- Clean and disinfect reusable boots.

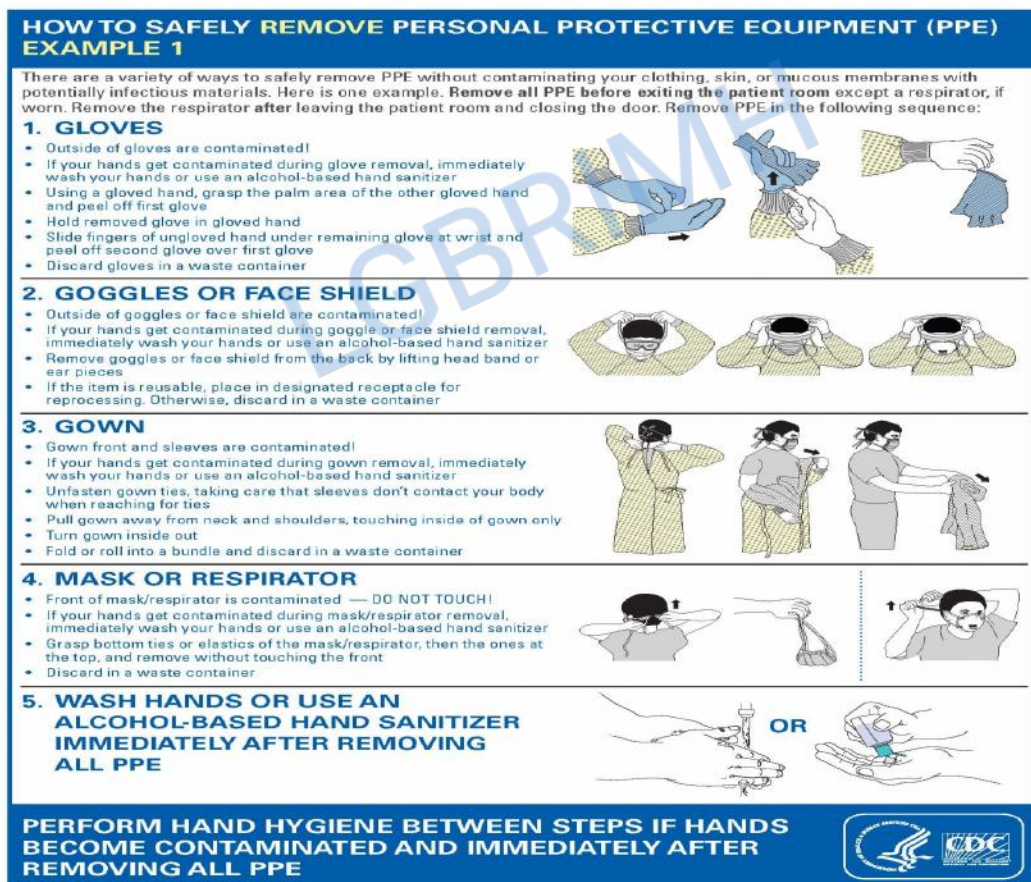


Fig 4:Doffing personal protective equipment

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Donning and doffing personal protective equipment

Donning PPE	Doffing PPE
<p>1.How to don an apron</p> <ul style="list-style-type: none"> • remove from pack/roll • place over head • tie in the rear 	<p>1.How to doff an apron</p> <ul style="list-style-type: none"> • break apron behind neck • roll into ball, avoiding the exterior • dispose off as clinical waste
<p>2. How to don a mask</p> <ul style="list-style-type: none"> • Secure on head with ear loops/tie • Place over nose, mouth, and chin • Fit flexible nose piece over bridge • Adjust fit – snug to face and below chin 	<p>2. Mask removal</p> <ul style="list-style-type: none"> • Front of mask is ‘dirty’; handle by ear-loops • Remove from face, in a downward direction, using ear-loops/ties • Discard
<p>3. How to don eye protection</p> <ul style="list-style-type: none"> • Position eyewear over eyes and secure to head using ear pieces or head loop if using visor 	<p>3.Eyewear removal</p> <ul style="list-style-type: none"> • outside of eyepiece is ‘dirty’; handle by earpieces • grasp earpieces with ungloved hands

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	<ul style="list-style-type: none"> • pull away from face • place in designated receptacle for reprocessing or dispose of if single use
<p>4. How to don gloves</p> <ul style="list-style-type: none"> • don gloves last • perform hand hygiene before donning new gloves • insert hands into gloves • keep gloved hands away from face • remove gloves if they become torn; 	<p>Glove removal</p> <ul style="list-style-type: none"> • outside of glove is ‘dirty’; use glove-to-glove/skin-to-skin handling method. • grasp outside edge near wrist • peel away from hand, turning glove inside out • hold in opposite gloved hand • slide ungloved finger under wrist of remaining glove • peel off from inside, creating a bag for both gloves • Discard • Wash hands

4.1.3: Patient Care Equipment

- Clean and reprocess reusable equipment and linen that has been in contact

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with a patient before use in the care of another patient.

- Patient care equipment soiled with blood or body fluids shall be decontaminated and cleaned to prevent transfer of micro-organisms to others and the environment.
- Items that are routinely shared among the patients needs to be cleaned between patients.
- Procedures shall be adopted for assigning responsibility and accountability for routine cleaning of all patient-care equipment. There should be dedicated personnel to carry out this task.
- Bedpans and urinals shall be decontaminated and disinfected between patient uses routinely.
- Toilets and commodes shall be cleaned regularly and when soiled.
- Disposable patient care equipment shall not be re-used and shall be discarded into a patient waste receptacle for disposal.

4.1.4: Respiratory hygiene/cough etiquette:

- Correct respiratory hygiene and cough etiquette is effective in decreasing the risk of transmission of pathogens contained in large respiratory droplets e.g. influenza virus. This is applicable to everyone entering, visiting or working within a hospital presenting with the signs and symptoms of an acute respiratory infection
- **General Principles :**
 - Cover mouth and nose when coughing or sneezing.
 - Dispose of tissues immediately into appropriate waste bin.

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- Perform hand hygiene frequently.

4.1.5: Safe injection policy:

- Masks, eye protection and other protective clothing **ARE NOT** indicated for the injection procedures unless exposure to blood splashes is expected.

- **Skin Preparation And Disinfection:**

To disinfect the skin, use the following steps

1. Apply a 60–70% alcohol-based solution (isopropyl alcohol or ethanol) on a single-use swab or cotton wool ball.
2. Wipe the area from the centre of the injection site working outwards, without going over the same area.
3. Apply the solution for 30 seconds then allow it to dry completely.

- **Practical Guidance On Use Of Injection Devices :**

When using a sterile single-use device

1. Use a new device for each procedure, including for the reconstitution of a unit of medication ;
2. Discard the device if the package has been punctured, torn or damaged by exposure to moisture, or if the expiry date has passed.
3. Medication : When giving medication:

- DO NOT use a single loaded syringe to administer medication to several patients (i.e. ensure one needle, one syringe, one patient!)
- DO NOT change the needle in order to reuse the syringe.
- DO NOT use the same mixing syringe to reconstitute several vials.
- DO NOT combine leftover medications for later use.

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- **Single-dose vials** – Whenever possible, use a single-dose vial for each patient, to reduce cross contamination between patients.
- **Multi dose vials** – Only use multi dose vials if there is no alternative.
 - i. Open only one vial of a particular medication at a time in each patient-care area.
 - ii. If possible, keep one multi dose vial for each patient, and store it with the patient’s name on the vial in a separate treatment or medication room.
 - iii. DO NOT store multi dose vials in the open ward, where they could be contaminated with spray or spatter.

Discard a multi dose vial:

- If sterility of content is compromised
- If the expiry date or time has passed (even if the vial contains antimicrobial preservatives)
- If it has not been properly stored after opening
- Within 24 hours of opening, or after the time recommended by the manufacturer, if the vial does not contain antimicrobial preservatives
- If found to be undated, improperly stored, inadvertently contaminated or perceived to be contaminated, regardless of expiry date.

Labeling:

- After reconstitution of a multi dose vial, label the final medication container with Date and time of preparation
- Final concentration
- Expiry date and time after reconstitution
- Name and signature of the person reconstituting the drug.

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➤ For multi dose medications that DO NOT requires reconstitution, add a label with: Date and time of first piercing the vial, Name and signature of the person first piercing the vial.

➤ **Delay in administration:**

- ✓ If the dose cannot be administered immediately for any reason, cover the needle with the cap using a one hand scoop technique.
- ✓ Store the device safely in a dry kidney dish or similar container.

Important points :

- ✓ DO NOT allow the needle to touch any contaminated surface.
- ✓ DO NOT reuse a syringe, even if the needle is changed.
- ✓ DO NOT touch the diaphragm after disinfection with the 60–70% alcohol (isopropyl alcohol or ethanol).
- ✓ DO NOT enter several multi dose vials with the same needle and syringe.
- ✓ DO NOT re-enter a vial with a needle or syringe used on a patient if that vial will be used to withdraw medication again (whether it is for the same patient or for another patient)

Practical guidance on prevention of sharps injuries

- ✓ Ensure that the patient is adequately prepared for the procedure
- ✓ Do not bend, break, manipulate or manually remove needles before disposal
- ✓ Avoid recapping needles, but if a needle must be recapped, use a single-handed scoop technique
- ✓ Discard used sharps and glass ampules immediately after use in the location where they were used
- ✓ Dispose them into a robust sharps container that is leak and puncture

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resistant (Labeled with a biohazard symbol) located in the area where the items were used, for transportation to the sharp pit .

- ✓ Place the sharps container within arm's reach (preferably in a secured area) to allow for easy disposal. Seal and replace sharps container when the container is three quarters full.
- ✓ Give verbal announcements when passing sharps
- ✓ Avoid hand-to-hand passage of sharp instruments by using a basin or neutral zone
- ✓ Sharp end of instruments shall be positioned away from oneself and others.
- ✓ If injured by sharps, follow the SOP for needle stick injury .

4.2: Transmission-based precautions:

Four categories of transmission-based precautions are available:

- Airborne precautions
- Droplet precautions
- Contact precautions
- Absolute (strict) isolation

4.2.1: Airborne precautions:

Airborne transmission occurs when droplet nuclei (evaporated droplets) <5 micron in size are disseminated in the air.

The following precautions need to be taken :

- Implement standard precautions
- Place patient in a single room that has a monitored negative airflow pressure, and is often referred to as a “negative pressure room” . The air should be discharged to the outdoors or specially filtered before it is circulated to other

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areas of the health care facility.

- Keep doors closed
- Anyone who enters the room must wear a special, high filtration, particulate respirator (e.g. N 95) mask.

4.2.2: Droplet precautions:

Droplet transmission occurs when there is adequate contact between the mucous membranes of the nose and mouth or conjunctivae of a susceptible person and large particle droplets (> 5 microns) which are usually generated from the infected person during coughing, sneezing, talking .

The following precautions need to be taken:

- Implement standard precautions.
- Place patient in a single room (or in a room with another patient infected by the same pathogen).
- Wear a surgical mask when working within 1-2 meters of the patient.
- Place a surgical mask on the patient if transport is necessary.

4.2.3: Contact precautions:

Organisms can be transmitted directly to susceptible people via contaminated equipment or by the hands of healthcare workers.

The following precautions need to be taken:

- Implement standard precautions.
- Place patient in a single room (or in a room with another patient infected by the same (pathogen).
- Wear a clean, non-sterile gown when entering the room if substantial contact with the patient, environmental surfaces or items in the patient's room is

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anticipated.

Components of Contact Precautions

A. Patient Placement

Preferred accommodation in acute care for Contact Precautions is a single room with a dedicated toilet and patient sink.

Other points relevant to patient placement include the following:

- Keep patient notes outside the room
- Keep patient bedside charts outside the room
- Disinfect hands upon leaving room and after writing in the chart
- Keep doors closed

B. Transfer of patients

Limiting transfer of a patient on contact precautions reduces the risk of environmental contamination. If transfer is necessary, it is important to ensure that infected or colonised areas of the patient's body are contained and covered.

Contaminated PPE should be removed and disposed off and hand hygiene performed before the patient is moved. Clean PPE should be put on before the patient is handled at the destination.

4.2.4: Strict Isolation :

Strict isolation is an isolation category designed to prevent transmission of highly contagious or virulent infections that may be spread by both air and contact.

The precautions that need to be followed are,

- Individual room (isolation ward); door should be kept closed.
- Masks, gowns & gloves are indicated for everyone entering the room.

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- Hygienic hand washing at entry to and exit from the room
- Incineration of excreta, body fluids, nasopharyngeal secretions
- Disinfection of linen
- Restrict visitors and staff
- Daily disinfection and terminal disinfection at the end of the stay
- Use of disposable (single-use) equipment

: Environmental cleaning:

Follow SOP for housekeeping.

4.: Body fluid splash & spill management:

Follow hospital protocol for spill management.

4.Care of health-care workers:

- Employees' health should be reviewed at recruitment, including immunization history and previous exposures to communicable diseases (e.g. tuberculosis) and immune status.
- Immunization recommended for staff includes: hepatitis A and B, influenza, measles, mumps, rubella, tetanus, and diphtheria. Immunization against varicella, rabies may be considered in specific cases.
- Health care workers with infections should report their illnesses/incident to staff clinics for further evaluation and management.
- All needlestick injuries are recorded, as well as the actions taken as a result of the injury.

Biomedical waste management:

Follow hospital manual for biomedical waste management.

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