MANUAL FOR

INFECTION PREVENTION & CONTROL

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

INFECTION PREVENTION BEGINS WITH AWARENESS AND ACTION

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HOSPITAL INFECTION PREVENTION CONTROL MANUAL

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INFECTION CONTROL MANUAL DECLARATION:

This Manual is the property of AIIMS Guwahati and is issued by the HICC, Guwahati. No part of this manual is authorized to be except by the HICC, AIIMS Guwahati under approval from the approving authority for this manual.

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REVISION RECORD SHEET

Serial No	Title	Page No	Revision number	Date	Details of Revision made

INTRODUCTION

Healthcare- associated infections (HAI) can be defined as an infection acquired in hospital by a patient who was admitted for a reason other than that of infection or an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility. As a general timeline, infections occurring more than 48 hours after admission are usually considered HAI. (WHO)

This policy describes the precautions and control measures that are essential for the prevention and management of infection through the application of research-based knowledge to practices which include: standard precautions, sterilization and disinfection, waste management, surveillance and audit.

The overall aim of this document is to provide evidence-based information in the prevention and control of infection. To fulfill this, aim a hospital infection control committee has been formed that will look after the infection control needs of the hospital. It is relevant to all staff including doctors, nursing officers, other clinical professionals and managers working in the hospital to help to fulfill their professional obligations with regard to both communicable disease and infection control.

This document will be reviewed and updated by the HICC every two years or as and when required.

Purpose:

1. To maintain standards in infection control measures and minimize hospital acquired infections in patients and staff.
2. To define policy and procedure regarding nosocomial infections at AIIMS, Guwahati.

The HICC consists of the following members:

1. Chief Patron – Prof. (Dr). Ashok Puranik, Executive Director, AIIMS Guwahati.
2. Chairman – Prof. (Dr). Neizekhoto Brian Shunyu, Medical Superintendent.
3. Member Secretary – Dr. Deepjyoti Kalita, Dept. of Microbiology
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6. Dr. Bhupen Baraman – Dept. of Gen Medicine.
7. Dr. Jaya Shankar Kaushik – Dept. of Paediatrics.
8. Dr. Kaustav Kumar Bairagi – Officer in charge (Laundry, Sanitation)
9. Dr. Ankur Khandelwal – Dept. of Anesthesiology.
10. Dr. Masaraf Hussain – Dept. of Neurology.
11. Dr. Deb K Boruah – Dept. of Radiology.
12. Dr. Gautam Sarma – Dept. of Radiotherapy.
13. Dr. Ramdas Sarjero Ransing- Dept. of Psychiatry.
14. Dr.Sumanjit S Boro – Dept. of Burns & Plastic surgery.
15. Dr. MD Jamil -Nodal Officer for NSI– Dept. of Gen Medicine.
16. Dr. Rajeswarie. S –Infection Control Officer, Dept. of Microbiology
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19. Dr. Krishna Prasad Biswas – Dept. of Dentistry.
20. Dr. Mary Zothanpuii Chhangte – Dept. of Dermatology.
21. Dr. Kewithinwangbo Newme – Dept of General Surgery.
22. Dr. Rituparna Chetia – Dept. of Medical Oncology.
23. Dr. Amrita Dutta – Dept. of OBG.
24. Dr. Kashif Akhtar Ahmed – Dept. of Orthopedics.
25. Dr. Jay Kishor Soren – Dept. of Paediatric Surgery.
26. Dr.Biraj Chandra Paul-Dept of Hospital Administration
27. Dr. Anirban Bhattacharjee-Dept of Anaesthesia &Critical care
28. Dr. Dibyajyoti Saikia-Dept of Pharmacology

Hospital Infection Control Core Committee

Dr. Rajeswarie S – Infection Control Officer, Dept. of Microbiology

29. Ms. Mumtri Borang – Infection Control Nursing officer

31. Ms. Neha Singh – Infection Control Nursing officer.

32. Ms.Srabana chandrawali baruah – Infection Control Nursing officer

Roles and Responsibilities of HICC:

- Developing and preparing various infection control policies and protocols.
- Promote, implement and monitor optimum infection control practice at all levels of the health facilities.
- To review and approve an annual program for surveillance and prevention of HAI.
- To review epidemiological surveillance data and identify the areas for interventions.
- To ensure appropriate staff training in infection control and prevention.
- Developing an effective and practical Antimicrobial Stewardship Program (AMSP) for the hospital.
- To review risks associated with new technologies and monitor infectious risks of new devices and products.
- To provide expert advice, analysis and leadership in outbreak investigation and Control in community.
- Research for Infection Control (IC).
- To communicate and cooperate with other committees of the hospital with common interest such as Biomedical Waste Management Committee, Hospital Blood Transfusion Committee, Antibiotic Policy Committee.

Roles and Responsibilities of Member-Secretary, HICC:

- Co-coordinating between hospital administration, Chairperson, other members of HICC and ICT (Infection Control Team)
- Developing recommendations of various Infection control policies with other members of HICC and ICT.
- Making an Antimicrobial stewardship program (AMSP) for the institute. Proposing an AMSP team to the Chairperson of HICC.
- Conducting regular meetings of HICC. Preparing minutes of the meeting and disseminating the same to all the stakeholders of healthcare facility.
- Conducting emergency meetings in case of outbreak or any other alert situation.
- Providing action plans in case of any outbreak or any other alert situation like isolation of MDRO from any patient of the hospital.

- Procuring relevant data from various healthcare units (wards) and laboratories of the hospital for surveillance of HAIs, outbreak investigation and making policies/ recommendations for AMSP.
- Coordinating the organization of various trainings and workshops for different cadres of HCWs on various aspects of Infection prevention and control.

Roles and Responsibilities of Infection Control Officer (ICO)

1 To supervise the surveillance of healthcare associated infections.

2. To supervise the various infection control programs.

3. To Co-ordinate with the HICC in planning Infection Control Programme and Policies.

4. To Develop SOPs for various Infection Control Practices.

5. To Compile and disseminate data on monitoring of various infection control practices like hand hygiene audit, in-use disinfection testing, environmental microbial surveillance etc. to the stake holders.

6. To Compile and present the data of HAIs, hand hygiene audit, disinfection testing, occupational exposure events, environmental testing etc. in the HICC Meetings.

7. To keep a track of any developing outbreaks. Plan and participate in appropriate management of an outbreak.

8. To participate, guide in research activities related to infection control practices and publish them.

9. Advise on the appropriate use of antibiotics.

10. To implement appropriate action in case of isolation of a MDRO/ Pan drug resistant bacteria in the laboratory. This information may be received regularly from the hospital bacteriology laboratory or from the clinician.

11. To ensure safe laboratory practices to prevent laboratory acquired infections among staff.

12. To compile and provides summary reports of prevalence of resistance, bacteria-wise, syndrome-wise and/or unit-wise.

13. Monitoring sterilization, disinfection and the environment where necessary.

Responsibility of Infection Control Nurse (ICN)

The ICN is the link between the HICC and the wards/ICUs etc. in identifying problems and implementing solutions.

1. To conduct daily Infection control rounds and records observations and maintain records and statistics regarding IC activities.

2. Active surveillance for four common HAIs namely, CLABSI (Central Line Associated Blood Stream Infection), CAUTI (Catheter Associated Urinary Tract Infection), VAP (Ventilator Associated Pneumonia) and SSI (Surgical Site Infection).

3. To ensure that all relevant positive culture cases are traced from inpatient unit, if it complies with the definition of a HAI, a hospital infection surveillance sheet or surgical site infection sheet is to be filled and recorded.

4. To work as a clinical supervisor by ensuring all the established policies and protocols are practiced like hand washing procedures, use of hand rubs, isolation policies, care of IV and vascular access, urinary catheters, universal precautions, housekeeping, cleaning and disinfection, PPE, equipment cleaning, etc.

5. To perform on-site auditing of various Infection control practices especially, universal precautions like hand hygiene, use of PPE etc.

6. To liaison between laboratory and ward staff: Informing head of department and giving advice on infection control issues.

7. To take immediate action in Needle Stick Injuries (NSIs) and other occupational exposures and facilitate post-exposure measures and to maintain data of Sharps/NSIs and Post–exposure prophylaxis.

8. Notification of communicable diseases and other notifiable disease to the ICO.

9. To inform anomalous/irrational use of antibiotics to ICO that must be discussed in HICC meetings.

10. The ICN is involved in education of practices minimizing healthcare associated Infections and in promoting hand hygiene among healthcare workers.

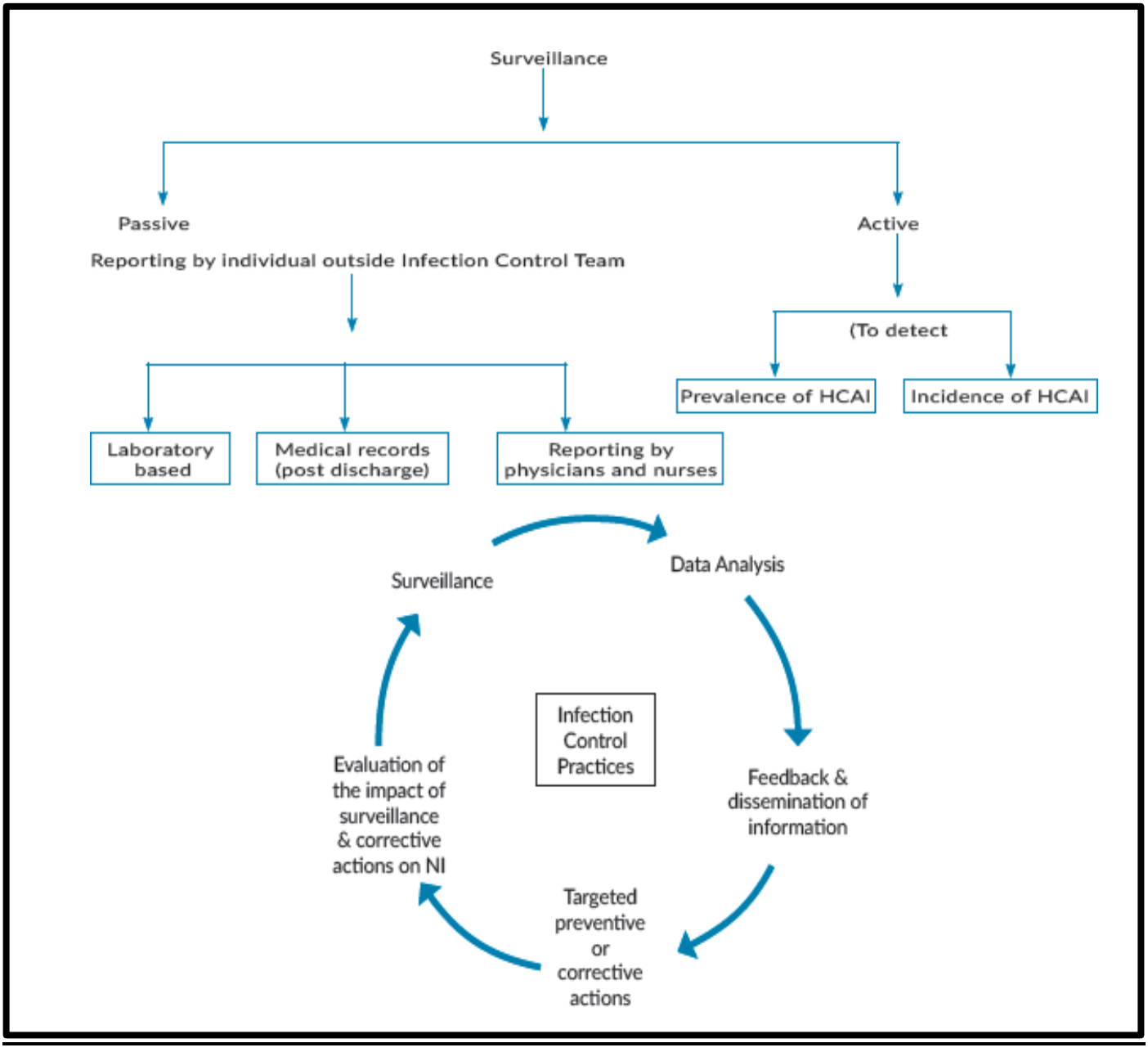
11. Monitoring engineering activities like maintenance of water filters/RO plants registers and cleaning register of water tanks etc.

12. To Conduct special tasks given as per components and objectives of the hospital infection prevention and control.

2. Surveillance and Reporting HAI

1. HAI SURVEILLANCE

Hospital Acquired Infection (HAI) surveillance is a system that monitors the HAIs in a hospital. The HAI surveillance cycle consists of 'data collection—data analysis—data interpretation—data dissemination'



Surveillance and reporting

2. OBJECTIVES OF HAI SURVEILLANCE

● To obtain endemic/ baseline HAI rate and information on type of HAI.
● To compare HAI rates within different wards/ areas of the hospital and among other hospitals.
● To identify the problem area, based on which root cause analysis is conducted to find out the breakdowns in infection control measures followed by which corrective measures will be implemented.
● To identify impending outbreaks and to prevent them.
● To monitor and evaluate the effect of infection control interventions.
● To provides timely feedback to the clinicians; thus reinforcing them to adopt best practices.

3. HEALTHCARE ASSOCIATED INFECTIONS TARGETED FOR SURVEILLANCE

Surveillance is done for following major HAIs at our institute.

1. Catheter Associated Urinary Tract Infections (CAUTI)
2. Central Line Associated Blood Stream Infections (CLABSI)
3. Ventilator Associated Pneumonia (VAP)
4. Surgical Site Infections (SSI)

4. AREAS OF SURVEILLANCE

The surveillance is currently being conducted in the following areas of the hospital and will be expanded further to cover newly developed areas of similar nature.

1. OT
2. High Dependency Units (HDU)
3. Emergency ward
4. Medical wards

5. PROCEDURE FOR HAI SURVEILLANCE

The surveillance is currently done by Active surveillance/ Laboratory based Ward liaison surveillance method which is considered as the best method for surveillance. In this, patients/ cases admitted in the above targeted areas are prospectively monitored by the trained ICNs on daily basis. The ICNs collect information on all new admissions and existing admissions with device (urinary catheter, central line, ventilator) and/or those who underwent surgeries. They also prospectively check the laboratory investigations to confirm a diagnosis. The definitions related to HAI surveillance and the protocol for data collection and analysis (including proformas for surveillance) are adopted from the National Health Safety Network (NHSN)-CDC guidelines for HAI surveillance (**refer to Annexure 1 for case definitions of major HAIs).**

The data is collected on monthly basis from each area of surveillance under following heads:

a. Data collection for Identification of HAI

b. Data collection for calculation of denominator values

5.1 Identification of HAI

- The patients admitted in respective surveillance area are daily monitored for development of HAIs of interest.
- The demographic and clinical details are collected by the ICNs in the standardized proforma for data collection pre-approved by the HICC.
- The ICNs also check Lab reports for these patients simultaneously and correlates with clinical findings.
- The surveillance is continued till 15 days of admission or till discharge/death of the patients.
- The ICNs also monitor patients undergoing major surgeries on daily basis in their respective ward for the development of post-operative infection till their discharge/ death.
- The monitoring for SSI is done for 30/ 90 days depending upon the type of surgery the patient had undergone .
- The patients which are discharged are followed up in the respective surgical OPD at the time of their follow up visit using a separate proforma.

At the end of month, all the proformas are submitted to Infection Control Officer, who then analyze them to diagnose the HAIs as per case definitions given by CDC.

5.2 Calculation of Denominator Values

ICNs also collect following data during their on their daily rounds to the hospital at the fixed time. The data is collected using Denominator Form (Daily Appraisal Form) .

● Patient days = Number of patients admitted daily in each area of surveillance.

● Device days = Number of patients with devices in the respective areas per day.

- Monthly catheter (Foley's) days
- Monthly central line days
- Monthly ventilator days

● Number of surgeries performed in each OT.

This data is summed up at the end of each month so as to be used as denominator data for calculation of Device utilization ratios and Rates of HAIs. Similarly, total number of surgeries performed are calculated at the end of every month as a denominator data to enable calculation of SSI rates.

6. CALCULATION OF HAI RATES

The standard CDC/ NSHN definition of HAIs is followed. The incidence of CAUTI, CLABSI and VAP are calculated for 1000 device days and the prevalence of SSI is calculated for 100 surgeries done. The formulae for calculation are given below.

HAI Infection Rates Formulae

VAP Rate =No. of VAP cases/ Total no. of ventilator days X 1000
CLABSI Rate =No. of CLABSI cases/ Total no. of central line days X 1000
CAUTI Rate =No. of CAUTI cases/ Total no. of catheter days X 1000
SSI Rate= No. of SSI/ No. of surgeries done X 100
DUR (Device Utilization Ratio) = No. of device (Foley's catheter/ central line/ ventilator) days /No. of patient days

7. DATA ANALYSIS, DISSEMINATION AND PRESENTATION

7.1. Data Analysis

The data is analyzed using Microsoft Excel to generate a monthly report of HAI rate of AIIMS Guwahati. Monthly HAI Surveillance report is used for:

- Comparison between two consecutive months, or
- Between different ICUs for the same month, or
- To observe the trend of HAIs over a specified period of time.
- To compare the HAIs rates of the hospital with that of CDC/NSHN HAI rate (75% percentile)

7.2. Data Dissemination

The monthly HAI surveillance report is shared with all clinical departments as well as with the Director, Medical Superintendent and the Nursing Co-ordinator via email and printed copy.

7.3. Data Presentation

The rates are presented in HICC meetings and discussed among the concerned members. The interventions are planned for each ICU/ward on the basis of the HAI rates. Further monitoring for any changes in the rates is done by ICT followed by feedback to the respective department.

3. Hand Hygiene

OBJECTIVE: To promote and practice hand hygiene by all the healthcare providers while providing patient care at various levels.

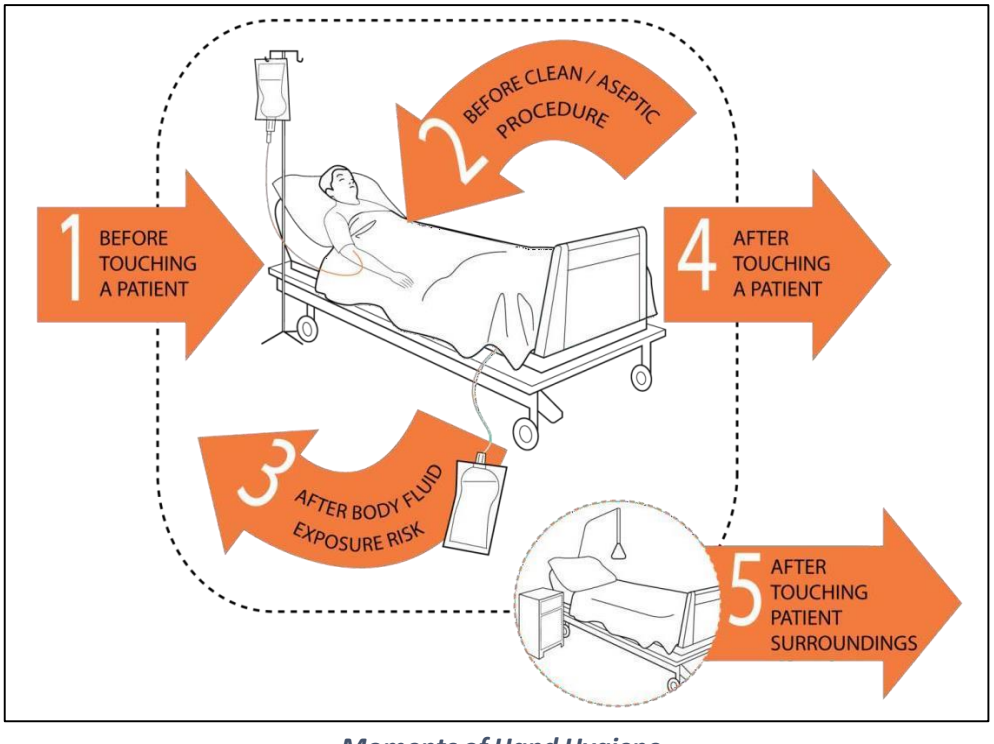
SCOPE: This document applies to healthcare professionals of all the cadres

WHEN TO PERFORM HAND HYGIENE?

Perform hand hygiene while caring for patients using 'Five MomentsApproach' recommended by WHO and as mentioned below:

a) Before touching the patient
b) Before any clean/aseptic procedures
c) After body fluid exposure risk
d) After touching the patient
e) After touching the patient surroundings

The "My 5 Moments for Hand Hygiene" Approach (WHO)



Moments of Hand Hygiene

HOW TO PERFORM HAND HYGIENE?

Hand hygiene may be performed by following methods depending upon the indications:

a. Hand washing with plain/antimicrobial soap
b. Hand rubbing with alcohol-based hand rubs
c. Surgical hand antisepsis

Hand Washing with Soap and Water: Use plain or preferably antimicrobial soap for hand washing.

Perform hand washing during following instances

Indications for Hand Washing ***

- If there is visible contamination of hands with blood or body fluids.
- If there is visible contamination with dirt or organic material.
- If exposure to potential spore-forming pathogens is strongly suspected or proven, including outbreaks of C. difficile.
- After using toilets/washrooms.
- Before and after having meals
- If alcohol-based hand rub is not obtainable.

***Hand rubbing is not recommended during these procedures.

Procedure for Hand Washing

To effectively reduce the growth of germs on hands, hand washing must last 40–60 Seconds. Following precautions should be undertaken while performing hand washing:

- ✓ When washing hands with soap and water, wet hands with water and apply the amount of product necessary to cover all surfaces.
- ✓ Rinse hands with water and dry thoroughly with a single-use towel.
- ✓ Use clean, running water whenever possible. Avoid using hot water, as repeated exposure to hot water may increase the risk of dermatitis.
- ✓ Use a towel to turn off tap/faucet.
- ✓ Dry hands thoroughly using a method that does not re-contaminate hands.
- ✓ Make sure towels are not used multiple times or by multiple people.
- ✓ Liquid, bar, leaf or powdered forms of soap are acceptable.
- ✓ When bar soap is used, small bars of soap in racks that facilitate drainage should be used to allow the bars to dry.

Hand Hygiene Technique with Soap and Water

Duration of the entire procedure: 40-60 seconds

Hand washing with soap and water

Hand Rubbing with Alcohol Based Hand Rubs

Indications for Hand Rubbing

- Before and after touching the patient
- Before handling an invasive device for patient care, regardless of whether or not gloves are used
- After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings
- If moving from a contaminated body site to another body site during care of the same patient
- After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient
- After removing sterile or non-sterile gloves
- Before handling medication or preparing food

Hand Rub Formulations: Recommended by WHO

Hand rubs should be compatible with any of the following requirements:

- Any product containing WHO formulations I or II

✓ Formulation I: Ethanol 80% v/v, glycerol 1.45% v/v, hydrogen peroxide (H_2O_2) 0.125% v/v.
✓ Formulation II: Isopropyl alcohol 75% v/v, glycerol 1.45% v/v, hydrogen peroxide 0.125% v/v

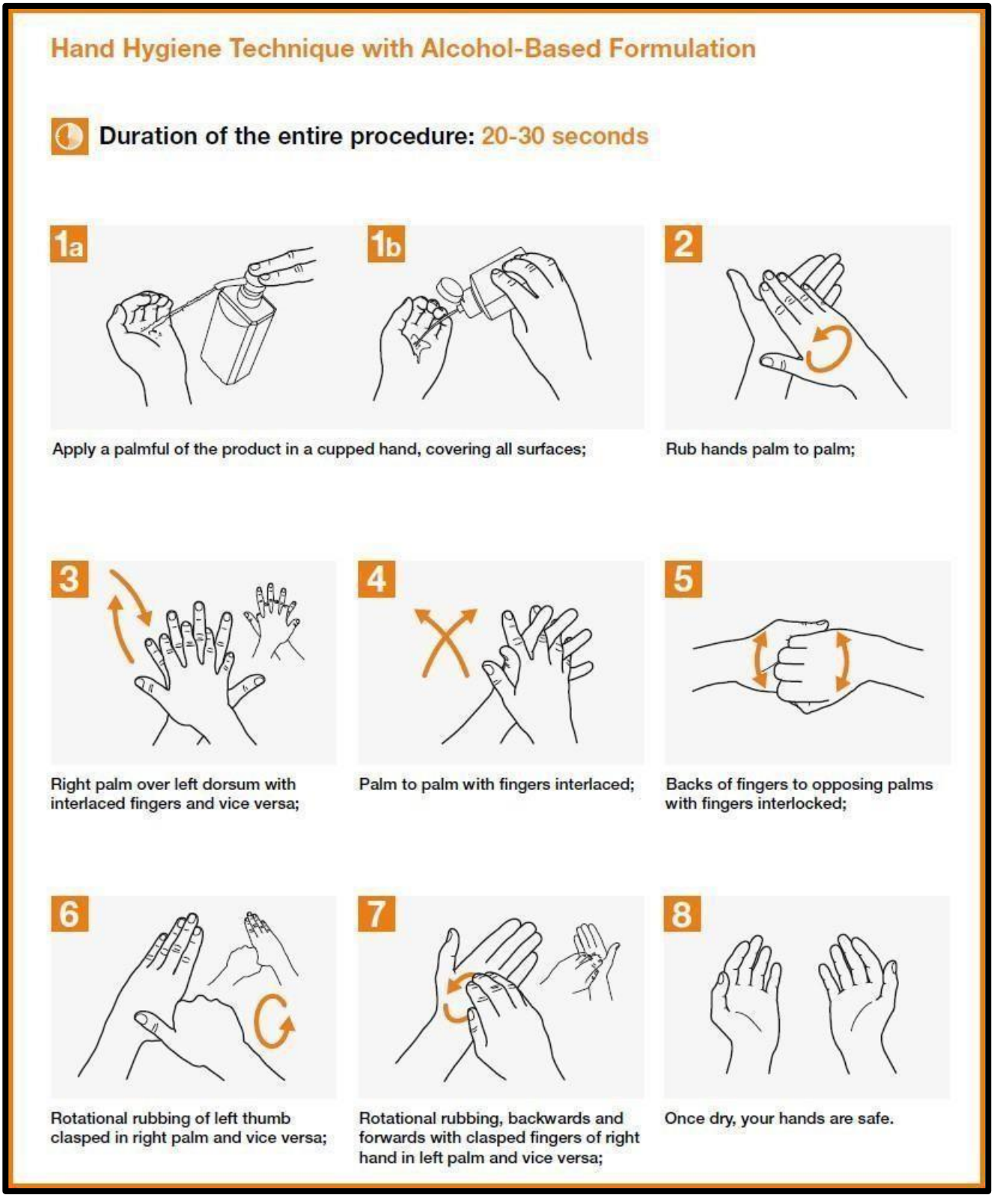
OR

✓ Any commercially available alcohol-based hand rub preparation which meets recognized standards for microbicidal efficacy (ASTM or EN standards – EN 1500)
✓ Hand rub containing Ethyl alcohol 70% + Chlorhexidine gluconate 0.5% w/v should be preferred for hand rubbing in high-risk settings like ICUs or while caring for patients with suspected infections with enveloped viruses or spore bearing pathogens.

The hand rub preparations should be available within reach, preferably closer to the point of care within 3 feet or should be carried by healthcare professional for personal use.

Procedure For Hand Rubbing

✓ To effectively reduce the growth of germs on hands, hand rubbing must be performed by following all the steps illustrated in Fig. 3. **The process takes only 20–30 seconds!**
✓ Apply a palmful of alcohol-based hand rub and cover all surfaces of hand. Rub hands until dry.



Hand washing with Alcohol-based product

Surgical Hand Preparation

Objectives:

a. To eliminate the transient and to reduce the resident skin flora in contrast to the hygienic handwash or hand rub.
b. To reduce the release of skin bacteria from the hands of the surgical team for the duration of the procedure in case of an unnoticed puncture of the surgical glove.
c. To inhibit growth of bacteria under the gloved hand.

Preparations before Surgical Hand Antisepsis

- ✓ Keep nails short and pay attention to them when washing your hands—most microbes on hands reside beneath the fingernails.
- ✓ Do not wear artificial nails or nail polish.
- ✓ Remove all personal ornaments (rings, wrist-watch, bangles and bracelets) before entering the operation theatre.
- ✓ Wash hands and arms with a non-medicated soap before entering the operating theatre area or if hands are visibly soiled.
- ✓ Remove debris from underneath fingernails using a nail cleaner, preferably under running water.
- ✓ Nail Brushes are not recommended for surgical hand preparation as they may damage the skin and encourage shedding of cells.
- ✓ Sinks should be designed to reduce the risk of splashes.
- ✓ Surgical hand antisepsis should be performed using either a suitable antimicrobial soap or suitable alcohol-based hand rub, preferably with a product ensuring sustained activity, before donning sterile gloves.

- When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for the length of time recommended by the manufacturer (typically 2–5 minutes) Long scrub times (e.g. 10 minutes) are not necessary.
- When using an alcohol-based surgical hand rub product with sustained activity, follow the manufacturer's instructions for application times. Apply the product to dry hands only.
- Do not combine surgical hand scrub and surgical hand rub with alcohol-based products sequentially.
- When using an alcohol-based hand rub, use sufficient product to keep hands and forearms wet with the hand rub throughout the surgical hand preparation procedure.
- After application of the alcohol-based hand rub as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves.

Procedure for Surgical Hand Preparation using Medicated Soap

Following protocol should be followed for surgical hand preparation using medicated soap and water:

Procedural steps
• Start timing. Scrub each side of each finger, between the fingers, and the back and front of the hand for 2 minutes.
• Proceed to scrub the arms, keeping the hand higher than the arm at all times. This helps to avoid recontamination of the hands by water from the elbows and prevents bacteria-laden soap and water from contaminating the hands.
• Wash each side of the arm from wrist to the elbow for 1 minute.
• Repeat the process on the other hand and arm, keeping hands above elbows at all times. If the hand touches anything at any time, the scrub must be lengthened by 1 minute for the area that has been contaminated.
• Rinse hands and arms by passing them through the water in one direction only, from fingertips to elbow. Do not move the arm back and forth through the water.
• Proceed to the operating theatre holding hands above elbows.
• At all times during the scrub procedure, care should be taken not to splash water onto surgical attire.
• Once in the operating theatre, hands and arms should be dried using a sterile towel and aseptic technique before donning gown and gloves.

Procedure for Surgical Hand Preparation using Alcohol based Hand Rubs

- Use alcohol-based hand rub formulations mentioned earlier in this document.
- While using WHO formulations as above, minimum three applications for the period of 3–5 minutes must be ensured.
- Alternatively, alcohol-based hand rubs containing 50–90% of alcohol with additional long-acting compounds like Chlorhexidine Gluconate may be used.

Precautions before surgical hand preparation using alcohol-based hand rubs:

- ✓ Ensure that the hands are visibly clean before application of alcohol hand rub
- ✓ Ensure that the hands are well dried before application of alcohol hand rub
- ✓ Follow the manufacturer's instructions for application times
- ✓ Use sufficient product to keep hands and forearms wet with the hand rub throughout the surgical hand preparation procedure
- ✓ Repeat hand rubbing is sufficient before switching to the next procedure without need for hand scrubbing or washing.
- ✓ Surgical procedures of more than two hours duration, surgeon should practice a second-hand rub of one minute duration.
- ✓ Use hand rubs after removing gloves when operation is over OR wash with soap and water in case of glove puncture or if any residual talc or biological fluids are present

The handrubbing technique for surgical hand preparation must be performed on perfectly clean, dry hands.
On arrival in the operating theatre and after having donned theatre clothing (cap/hat/bonnet and mask), hands must be washed with soap and water.
After the operation when removing gloves, hands must be rubbed with an alcohol-based formulation or washed with soap and water if any residual talc or biological fluids are present (e.g. the glove is punctured).

Surgical procedures may be carried out one after the other without the need for handwashing, provided that the handrubbing technique for surgical hand preparation is followed (Images 1 to 17).

1

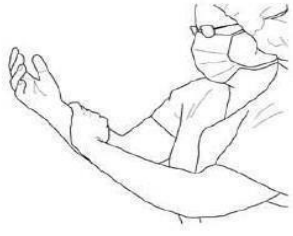
Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your left hand, using the elbow of your other arm to operate the dispenser

2

Dip the fingertips of your right hand in the handrub to decontaminate under the nails (5 seconds)

3

Images 3–7: Smear the handrub on the right forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)



4

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8

Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your right hand, using the elbow of your other arm to operate the dispenser

9

Dip the fingertips of your left hand in the handrub to decontaminate under the nails (5 seconds)

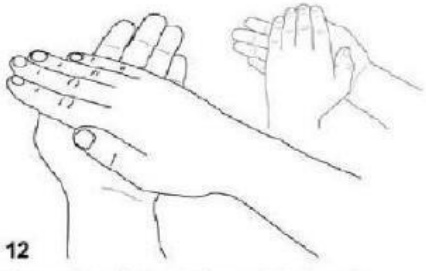
Surgical Hand Preparation

10

Smear the handrub on the left forearm up to the elbow. Ensure that the whole skin area is covered by using circular movements around the forearm until the handrub has fully evaporated (10-15 seconds)

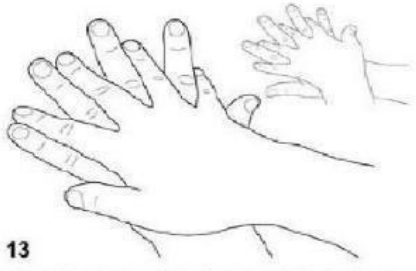
11

Put approximately 5ml (3 doses) of alcohol-based handrub in the palm of your left hand, using the elbow of your other arm to operate the distributor. Rub both hands at the same time up to the wrists, and ensure that all the steps represented in Images 12-17 are followed (20-30 seconds)



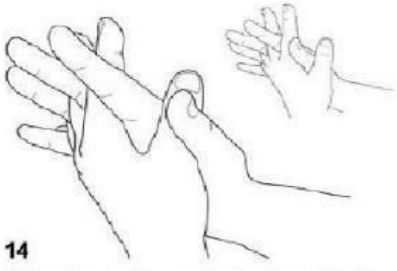
12

Cover the whole surface of the hands up to the wrist with alcohol-based handrub, rubbing palm against palm with a rotating movement



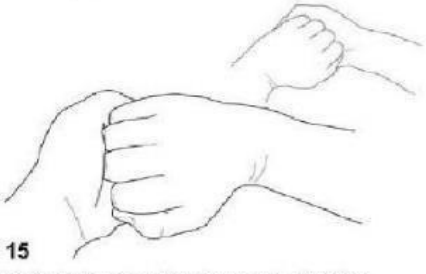
13

Rub the back of the left hand, including the wrist, moving the right palm back and forth, and vice-versa



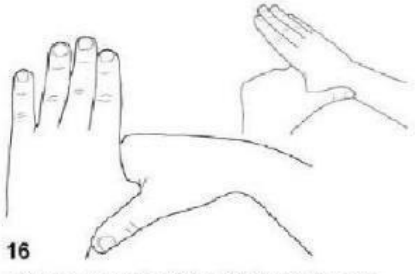
14

Rub palm against palm back and forth with fingers interlinked



15

Rub the back of the fingers by holding them in the palm of the other hand with a sideways back and forth movement



16

Rub the thumb of the left hand by rotating it in the clasped palm of the right hand and vice versa

17

When the hands are dry, sterile surgical clothing and gloves can be donned

Repeat the above-illustrated sequence (average duration, 60 sec) according to the number of times corresponding to the total duration recommended by the manufacturer for surgical hand preparation with an alcohol-based handrub.

Surgical Hand Preparation

REFERENCE [1]WHO guidelines for hand hygiene in healthcare. First global patient safety challenge, clean care is safer care. World Health Organization.

4. PERSONAL PROTECTIVE EQUIPMENT

To promote and practice use of personal protective equipment's appropriate for the task while providing patient care by all the healthcare providers.

SCOPE:

This document applies to healthcare professionals of all cadres

DEFINITION:

PPE is specialized clothing or equipment worn by a healthcare professional for protection against infectious materials.

TYPES OF PPE USED IN HEALTHCARE

- Gloves—protect hands
- Gowns/aprons—protect skin and/or clothing
- Masks—protect mouth/nose
- Respirators—protect respiratory tract from airborne infectious agents
- Goggles—protect eyes
- Face shields—protect face, mouth, nose, and eyes.
- Cap/hair cover—to protect hairs
- Boots/shoe cover—to protect feet

HOW TO CHOOSE APPROPRIATE PPE?

Selection of PPE is based on the type of patient interaction, known or possible infectious agents, and/ or likely mode(s) of transmission. Following factors may be considered while choosing PPE:

- Probability of exposure to blood or body substances
- Type of body substance involved
- Probable type and probable route of transmission of infectious agents.

DO's AND DON'Ts WHILE USING PPE

- Always use PPE whenever contact with blood or body fluids of patients is expected.
- Always use PPE most 'appropriate' for the task.
- Use of PPE should not replace the basic procedures of infection control like hand hygiene.
- Do not share the PPE.
- Avoid contact with contaminated (used) PPE and surfaces.
- Change the PPE completely and wash your hands each time you leave a patient to attend another patient or another duty.
- Discard the used PPE in appropriate disposal bags.

GUIDELINES FOR USE OF PPE

Gloves

Objective: To protect both patients and healthcare workers from exposure to infectious agents that may be carried on hands.

Indications for glove use

- Before a sterile procedure
- Anticipation of a contact with blood or body fluid, regardless of the existence of sterile conditions and including contact with non-intact skin and mucous membrane
- Contact with a patient (and his or her immediate surroundings) during contact precautions

Indication of glove removal

- As soon as gloves damaged (or non- integrity is suspected)
- After contact with blood, or body fluid, non- intact skin and mucus membrane
- After contact with a patient and their surroundings or a contaminated body site
- When there is an indication for hand hygiene

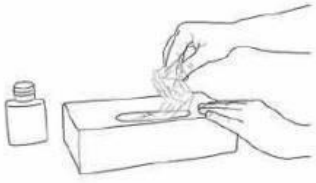
Dos and Don'ts while using gloves

- Don't touch your face or adjust PPE with contaminated gloves.
- Don't touch environmental surfaces except as necessary during patient care.
- Remove gloves immediately after use and before attending to another patient.
- Discard used/ contaminated gloves in red colored waste bin.
- Perform hand hygiene either by hand washing with soap and water or by alcohol-based hand rubs (refer to Chapter 4 of this manual) before putting gloves and after removing gloves.

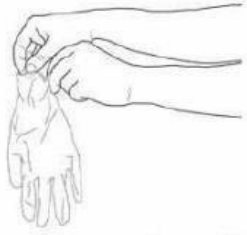
Types of gloves	Indication of use	Examples
Non sterile gloves	Used for procedure where there is high risk transmission of infections from patient to health care workers: • Potential exposure to blood, body fluid, secretions or excretions. • Contact with non-intact skin or mucous membranes.	• Venipuncture • Vaginal examination • Dental examination • Emptying urinary catheter bag • Nasogastric aspiration • Management of minor cuts and abrasions
Sterile gloves	Used for procedure where sterile environment is required and prevents the risk transmission of infections from patient to health care workers and vice versa	Surgical aseptic technique procedures: • Urinary catheter site dressings Central venous insertion site dressing • Lumbar puncture • Clinical care of surgical wounds or drainage sites • Dental procedure requiring a sterile field line
Reusable utility gloves	Indicated for non-patient care activities	• Handling or cleaning contaminated equipment or surfaces • Housekeeping duties Instrument cleaning in CSSD unit

When the hand hygiene indication occurs before a contact requiring glove use, perform hand hygiene by rubbing with an alcohol-based handrub or by washing with soap and water.

I. HOW TO DON GLOVES:

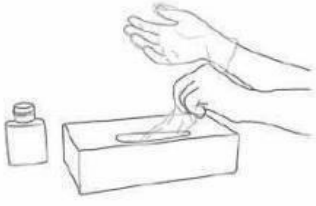


1. Take out a glove from its original box



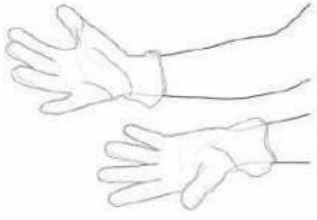
2. Touch only a restricted surface of the glove corresponding to the wrist (at the top edge of the cuff)

3. Don the first glove



4. Take the second glove with the bare hand and touch only a restricted surface of glove corresponding to the wrist

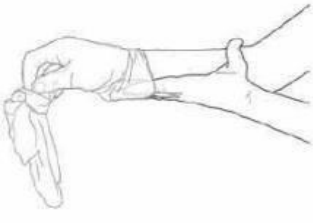
5. To avoid touching the skin of the forearm with the gloved hand, turn the external surface of the glove to be donned on the folded fingers of the gloved hand, thus permitting to glove the second hand



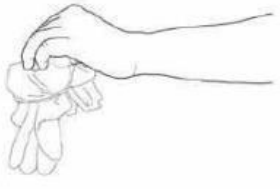
6. Once gloved, hands should not touch anything else that is not defined by indications and conditions for glove use

II. HOW TO REMOVE GLOVES:

1. Pinch one glove at the wrist level to remove it, without touching the skin of the forearm, and peel away from the hand, thus allowing the glove to turn inside out



2. Hold the removed glove in the gloved hand and slide the fingers of the ungloved hand inside between the glove and the wrist. Remove the second glove by rolling it down the hand and fold into the first glove



3. Discard the removed gloves

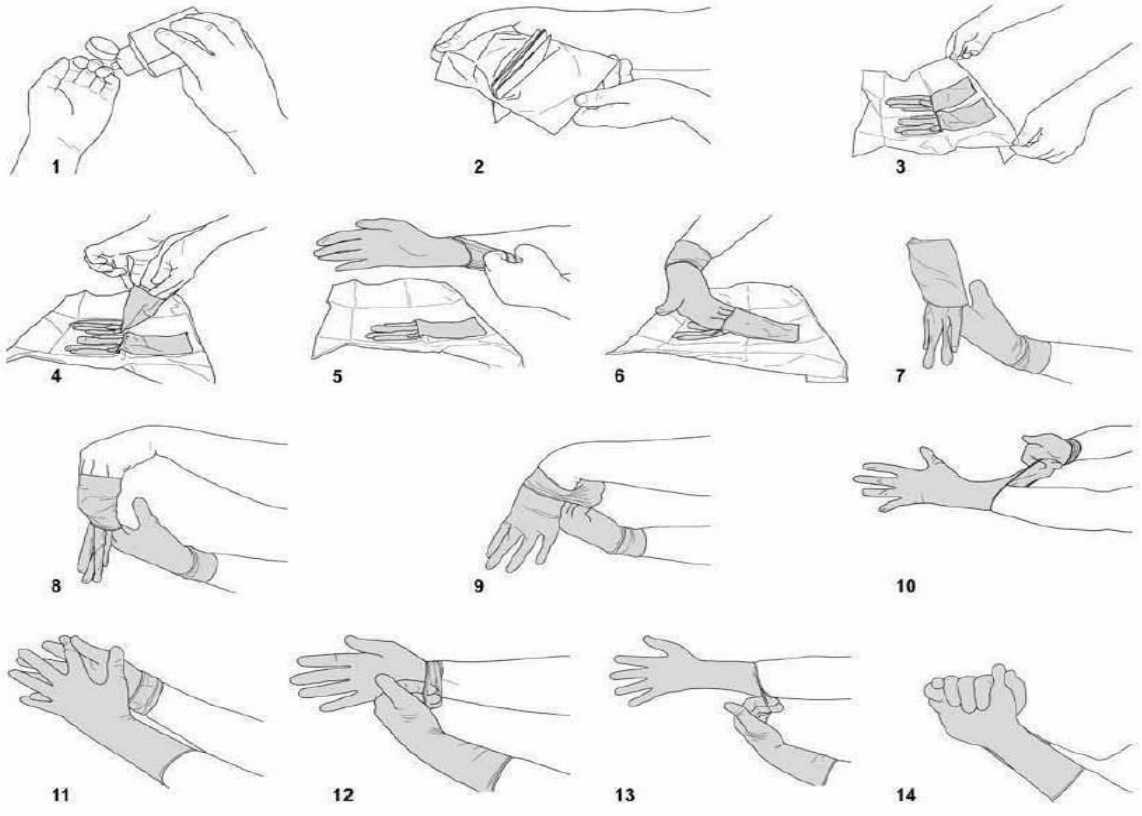
4. Then, perform hand hygiene by rubbing with an alcohol-based handrub or by washing with soap and water

Donning & Doffing Non-sterile gloves

Follow the procedures as illustrated in Fig. 4.1 (for non-sterile gloves) and Fig. 4.2 & 4.3 (for sterile gloves) of this document.

The purpose of this technique is to ensure maximum asepsis for the patient and to protect the health-care worker from the patient's body fluid(s). To achieve this goal, the skin of the health-care worker remains exclusively in contact with the inner surface of the glove and has no contact with the outer surface. Any error in the performance of this technique leads to a lack of asepsis requiring a change of gloves.

I. HOW TO DON STERILE GLOVES



1. Perform hand hygiene before an "aseptic procedure" by handrubbing or hand washing.
2. Check the package for integrity. Open the first non-sterile packaging by peeling it completely off the heat seal to expose the second sterile wrapper, but without touching it.
3. Place the second sterile package on a clean, dry surface without touching the surface. Open the package and fold it towards the bottom so as to unfold the paper and keep it open.
4. Using the thumb and index finger of one hand, carefully grasp the folded cuff edge of the glove.
5. Slip the other hand into the glove in a single movement, keeping the folded cuff at the wrist level.

6-7. Pick up the second glove by sliding the fingers of the gloved hand underneath the cuff of the glove.

8-10. In a single movement, slip the second glove on to the ungloved hand while avoiding any contact/resting of the gloved hand on surfaces other than the glove to be donned (contact/resting constitutes a lack of asepsis and requires a change of glove).

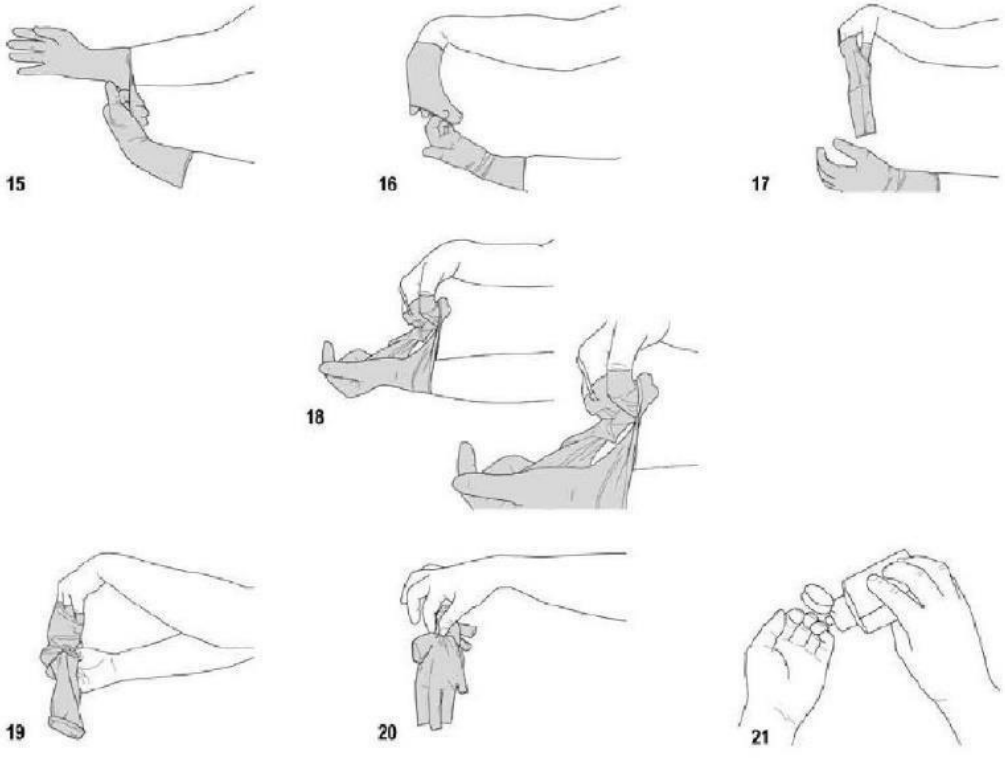
11. If necessary, after donning both gloves, adjust the fingers and interdigital spaces until the gloves fit comfortably.

12-13. Unfold the cuff of the first gloved hand by gently slipping the fingers of the other hand inside the fold, making sure to avoid any contact with a surface other than the outer surface of the glove (lack of asepsis requiring a change of gloves).

14. The hands are gloved and must touch exclusively sterile devices or the previously-disinfected patient's body area.

Donning of sterile gloves

II. HOW TO REMOVE STERILE GLOVES



15-17. Remove the first glove by peeling it back with the fingers of the opposite hand. Remove the glove by rolling it inside out to the second finger joints (do not remove completely).
18. Remove the other glove by turning its outer edge on the fingers of the partially ungloved hand.
19. Remove the glove by turning it inside out entirely to ensure that the skin of the health-care worker is always and exclusively in contact with the inner surface of the glove.
20. Discard gloves.
21. Perform hand hygiene after glove removal according to the recommended indication.

NB: Donning surgical sterile gloves at the time of a surgical intervention follows the same sequences except that:

- it is preceeded by a surgical hand preparation;
- donning gloves is performed after putting on the sterile surgical gown;
- the opening of the first packaging (non-sterile) is done by an assistant;
- the second packaging (sterile) is placed on a sterile surface other than that used for the intervention;
- gloves should cover the wrists of the sterile gown.

Doffing Sterile gloves

GOWNS

Objective: To protect the healthcare workers' arms and exposed body areas and prevent contamination of clothing with blood, body fluids and other potentially infectious material.

Dos and Don'ts while using Gowns

- ✓ Wear isolation gown when contact with blood or body fluid is expected while following standard precautions.
- ✓ While following contact precautions, wear both gowns and gloves while entering the isolation room.
- ✓ Wear gowns as a first piece of PPE followed by all others.
- ✓ Choose a gown with appropriate fitting.
- ✓ A clean non-sterile apron/gown is generally adequate to protect skin and prevent soiling of clothing during procedures and patient care activities that are likely to generate splashes/ sprays of blood or body fluids.
- ✓ Use fluid resistant apron gown (made of plastic) when there is a risk that clothing may become contaminated with blood, body fluids, excretions or secretions (Except sweat).
- ✓ Fluid resistant gowns are always to be used along with gloves and other PPE when indicated.
- ✓ Ensure that the gown provides full coverage of the arms and body front, from neck to mid-thigh or below.
- ✓ Removal of gown: The outer contaminated side of the gown should be turned inward and rolled into a bundle and then discarded into a designated container.
- ✓ Perform hand hygiene after removal of gown.

Donning & Doffing of Gown

Masks

Objective: To protect patients from respiratory secretions of healthcare workers as well as to protect healthcare staff while caring for patients with airborne infections, or when performing any procedures with anticipated splashes of blood or body fluids.

Dos and Don'ts for Wearing a Mask

- ✓ Surgical masks are preferred over cotton or gauze masks.
- ✓ Do not reuse disposable masks
- ✓ Change masks whenever they are soiled or wet
- ✓ Do not reapply the same mask after they have been removed
- ✓ Masks should not be left dangling around the neck
- ✓ Do not touch the mask from front while wearing it
- ✓ Use specifically designed masks for children and their oxygen saturation should be monitored.

When to Use Surgical Mask?

- Use surgical masks on coughing patients to limit potential dissemination of respiratory pathogens.
- Use surgical masks as a part of standard precautions to keep splashes or sprays from reaching the mouth and nose of person exposed.
- While caring for patients on droplet precautions.

Donning & Doffing of Mask

Using N95 Respirator / any Particulate Respirator

Indication for Use: When dealing with patients infected with highly transmissible respiratory pathogens while following droplet precautions (e.g., HCW dealing with open tuberculosis cases/ influenza patients)

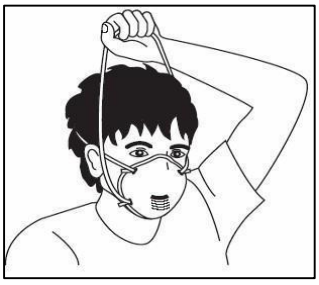
Wearing the Respirator

- Select a fit tested respirator
- Place over nose, mouth and chin
- Fit flexible nose piece over nose bridge
- Secure on head with elastics
- Adjust to fit
- Perform a fit check
  - Inhale—respirator should collapse
  - Exhale—check for leakage around face

Wearing the Respirator

Removing the Respirator

- Always remove it just outside the patient room.
- Lift the bottom elastic over your head first
- Then lift off the top elastic
- Discard and perform hand hygiene.



Removing the Respirator

Protective Eye Wear and Face Shield

Objective: To protect the mucous membranes of the eyes when conducting procedures that are likely to generate splashes of blood, body fluids, secretions or excretions.

Types and Uses:

- Goggles—Used to protect eyes only
- Face shields—Used protect face, nose, mouth, and eyes.

Goggles

- Should fit snuggly over and around eyes
- Personal glasses not a substitute for goggles
- Antifog feature improves clarity

Face Shields

- Should cover forehead, extend below chin and wrap around side of face.
- Single use/reusable face shields may be used in addition to surgical masks as an alternative to protective eye wear.

Removing Face and Eye Protection

- Should be removed after gloves have been removed and hand hygiene performed.
- The ties, earpieces and /or headband used to secure the equipment to the head are considered 'clean' and therefore safe to touch with bare hands.
- The front of a mask, protective eyewear or face shield is considered contaminated.

Cleaning Reusable Face and Eye Protection

- Reusable face shields and protective eyewear should be cleaned according to the manufacturer's instructions, generally with detergent solution, and be completely dry before being stored.
- Disinfection may be done by any low-level disinfectant solution.

Caps and Boots/Shoe Covers

Objective: To protect against exposure to patient's blood, body fluids, secretions or excretions, whichmay splash onto hairs or shoes.

- ✓ **Dos and Don'ts**
- ✓ Launder caps and shoe covers appropriately if they are reusable, followed by disinfection.
- ✓ Do not reuse disposable caps/ shoe covers. Discard them after each use in appropriate container.

Sequence of Wearing and Removing the

Following sequence should be followed while wearing and removing the full PPE as per the situation.

Sequence of Wearing

1. Gown first (wear shoe covers prior if required)
2. Cap/ head cover
3. Mask or respirator
4. Goggles or face shield
5. Gloves

Sequence of Removing

1. Gloves
2. Face shield or goggles
3. Gown
4. Mask or respirator
5. Cap/ head cover
6. Shoe cover

REFERENCES:

[1] WHO guidelines for hand hygiene in Healthcare. First global patient safety challenge, Clean care is safer care. World Health Organization,2009.

[2] Prevention of hospital acquired infections, A practical guide, 2nd edition, WHO/CDS/CSR/EPH/2002.12

[3] Guidance for the Selection and Use of Personal Protective Equipment (PPE) in Healthcare Settings. CDC Atlanta. Accessed from https://www.cdc.gov/hai/prevent/ppe.html

5. TRANSMISSION BASED PRECAUTIONS

This refers to specific precautions which are to be followed in situations where standard precautions may not be sufficient to interrupt the specific transmission of diseases depending upon their mode of transmission (as listed in table 1).

These precautions are taken in addition to standard precautions not as a replacement and are also known as additional precautions.

5.1. Categories of Transmission based Precautions

There are three categories of Transmission-Based Precautions:

- Contact Precautions
- Droplet Precautions
- Airborne Precautions

5.1.1. Contact Precautions:

These precautions are to be applied while offering a care to patients suffering from following conditions or infected with following microorganisms.

- Abscess/wound infection: major, draining
- Bronchiolitis
- Burkholderia cepacia: patient with cystic fibrosis, infection or colonization
- Conjunctivitis: acute viral
- Gastro-enteritis: C. difficile, Rotavirus, diapered or incontinent person for other infectious agents
- Diphtheria: cutaneous
- Hepatitis, type A and E virus: diapered or incontinent person
- Herpes simplex virus: mucocutaneous, disseminated or primary, severe, and neonatal
- Human metapneumovirus
- Impetigo
- Lice (pediculosis)
- Multidrug-resistant organisms: infection or colonization – by MRSA, VRE, CRE, MDR GNBs
- Para-influenza virus
- Poliomyelitis
- Pressure ulcer: infected
- Respiratory infectious disease: acute, infants and young children
- Respiratory syncytial virus: in infants, young children and immunocompromised adults
- Rubella: congenital
- Scabies

- Leprosy
- Gonorrhoea
- Staphylococcal disease: Furunculosis, scalded skin syndrome, burns

Special Precautions:

Hand Hygeine	• Follow all 5 moments all the time • Use Chorhexidine based hand rubs instead of alcohol based rubs in case of patients infected with C.difficle or non-enveloped viral infections (Rotaviral or Noroviral Diarrhoea) • Prefer hand wash if Chlorhexidine based hand rubs are not available in above situations.
PPE	• Wear gloves and gowns upon entering the patient room • A surgical mask or protective eyewear must be worn if there is potential for generation of splashes or sprays of blood and body fluids into face and eyes. • Remove and discard the gloves and gown before leaving the area.
Equipment cleaning	• Use patient dedicated equipment or single use disposable equipment wherever possible • If dedicated equipment is not possible, clean the equipment and allow it to dry before using on another patient.
Patient Isolation	A single-patient room is recommended • Keep patients notes and bedside charts outside the room • Keep doors closed • Disinfect hands upon leaving the room and after writing the chart • If single room is not available: 1. Avoid placing these patients with other patients with increased susceptibility of infection 2. Change protective attire and perform hand hygiene between contact with patients in the same room.
Transfer of Patient	• Avoid transfer of patients so far as possible • If transfer is necessary, ensure that the infected or colonised areas of patients are covered and contained. • Wear PPE while handling the patients at the destination

5.1.2. Droplet Precautions

These precautions are to be applied while offering care to patients infected with organisms which are transmitted through respiratory droplets (>5µm) generated by patients during coughing, sneezing or talking. As these droplets can travel only short distance (<1 metre), precautions are required when close contact with the infected patient is expected.

Following diseases/infectious agents warrants droplet precautions:

- Diphtheria: pharyngeal
- Influenza virus: seasonal
- Coronavirus disease (COVID-19)
- Invasive disease: H. influenzae type b, N. meningitidis, Streptococcus group A
- Mumps
- Parvovirus B19: Erythema infectiosum
- Pertussis (whooping cough)
- Plague: pneumonic
- Pneumonia: Adenovirus, H. influenzae type b (infants and children), Mycoplasma
- Rhinovirus, Respiratory syncytial virus
- Rubella
- Streptococcus group A disease: pharyngitis and scarlet fever (infants and young children)
- Viral haemorrhagic fevers due to Lassa, Ebola, Marburg, Crimean- Congo fever viruses

Hand hygiene	Hand hygiene is must and should be followed as per standard protocol as some infections transmitted by droplet route can also be transmitted through contact.
PPE	• A surgical mask is must upon room entry. • Hand hygiene should be done before putting on the mask and after removing he mask. • Masks are put whenever HCW is at a short distance from patient (<1 metre). • P2 respirators are not required.
Patient Isolation	• A single-patient room is recommended. • If single room is not available: 1. Priority for single room is given to those patients who have excessive cough and sputum production. 2. Cohortise the patients who are infected with the same pathogen and who are suitable room mates. • If it becomes necessary to place the patients requiring droplet precautions in the same room with patients who do not require it or do not have the same infection— 1. Patients should be physically separated (>1 metre apart) from each other and a privacy curtain is drawn in between them. 2. Avoid placing such patients with in the same room with immuno compromised status or increased susceptibility to Infections
Transfer	Ask the patients to wear a mask while they are being transferred and follow respiratory hygiene and cough etiquette

5.1.3. Airborne Precautions

These precautions are applied while dealing with patients having respiratory infections by pathogens which are transmissible through droplet nuclei ≤5 µm. These particles remain suspended in the air for longer duration and can travel longer distances (>1metre).

Indications for following these precautions are:

- Influenza A: Avian H7N9, Asian H5N1
- Measles
- MERS-Coronavirus: Middle East Acute Respiratory Syndrome
- Mycobacterium tuberculosis: Laryngeal and pulmonary disease, extra-pulmonary draining lesion
- Smallpox
- Varicella-zoster: Disseminated disease, localized disease in immunocompromised patient
- Monkey pox

PPE	N95 mask when entering the patients room. • Surgical mask do not offer protection but may be given to the coughing patients to limit the spread of aerosols and droplets at the point of generation. • Gloves and gowns are to be worn as per standard precaution.
Patient Isolation	• A single-patient room preferably having negative pressure ventilation is recommended • Door of the room should remain closed • Ask patients to wear surgical mask if he is with other patients in the same room. • Only staff or visitors immune to the infectious agent should be allowed to enter the room if possible
Transfer of Patient	• Ask the patients to wear a a correctly fitted mask while they are being transferred and follow respiratory • hygiene and cough etiquette. Limit transfer as much as possible Any associated skin lesions with the condition should be covered

Isolation policy for certain groups of organisms

- MRSA: When MRSA is isolated in the lab the microbiologist will inform the sister-in charge/duty doctor/head of unit. Patient is isolated and barrier nursed. Hand washing is strictly adhered to by all concerned. Linen is changed on a daily basis. Dirty linen is carefully packed in red bag with proper label and sent to laundry.
- Multi-resistant bacteria e.g. Imipenem resistant Acinetobacter, multi-resistant Pseudomonas aeruginosa: The aim is to curtail the spread of such bacteria. Hence patient is to be placed on strict barrier nursing precautions irrespective of whether the organism is a colonizer or the cause of infection.
- Pulmonary tuberculosis: Masks are used during the care of all patients with sputum positive pulmonary tuberculosis.
  *Note: Isolation precautions are to be followed until all previous culture sites are negative.
- HIV/HBsAg/ HCV infected patients: Standard precautions

An Update: WHO in April 2024 introduced IRP

Individuals infected with a respiratory pathogen can generate and expel infectious particles containing the pathogen, through their mouth or nose by breathing, talking, singing, spitting, coughing or sneezing. These particles should be described with the term **'Infectious respiratory particles' or IRPs.**

IRPs exist on a continuous spectrum of sizes, and no single cut off points should be applied to distinguish smaller from larger particles. This facilitates moving away from the dichotomy of previously used terms: 'aerosols' (generally smaller particles) and 'droplets' (generally larger particles).

The descriptor 'through the air' can be used in a general way to characterize an infectious disease where the main mode of transmission involves the pathogen travelling through the air or being suspended in the air. Under the umbrella of 'through the air transmission', two descriptors can be used:

1. Airborne transmission or inhalation, for cases when IRPs are expelled into the air and inhaled by another person. Airborne transmission or inhalation can occur at a short or long distance from the infectious person and distance depends on various factors (airflow, humidity, temperature, ventilation etc). IRPs can theoretically enter the body at any point along the human respiratory tract, but preferred sites of entry may be pathogen-specific.

2. Direct deposition, for cases when IRPs are expelled into the air from an infectious person, and are then directly deposited on the exposed mouth, nose or eyes of another person nearby, then entering the human respiratory system and potentially causing infection.

6. Cleaning and Disinfection of Hospital Environment

1.1 Purpose:

To define the process of Cleaning, Disinfectant and Sterilisation process in Hospital Environment

1.2 Scope:

This policy is to be followed by all Healthcare workers and Staff working in AIIMS Guwahati.

1.3 Definitions:

Cleaning is the removal of foreign material (e.g., soil, and organic material) from objects or surfaces and is normally accomplished using water with detergents or enzymatic products.

Disinfection describes a process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects.

Sterilization describes a process that destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods.

Disinfectant: usually a chemical agent (but sometimes a physical agent) that destroys disease-causing pathogens or other harmful microorganisms but might not kill bacterial spores.

Fumigation/Fogging: The spraying or fogging of chemicals (e.g., formaldehyde, phenol-based agents, or quaternary ammonium compounds) as a way to decontaminate environmental surfaces or disinfect the air in patient rooms.

Decontamination: OSHA defines Decontamination as "the use of physical or chemical means to remove, inactivate, or destroy blood-borne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use, or disposal".

Contact time: Time a disinfectant is in direct contact with the surface or item to be disinfected.

1.4 Environment Cleaning:

1.4.1 Commonly used Disinfectants and its purposes:

Sl.No.	DISINFECTANT NAME	PURPOSE OF USE
1.	Lysol (7%)	• Floor cleaning • Cleaning of toilets • Discarding bowls/ jars in lab • Sputum of pots in TB labs • Not to be used in newborn units
2.	Phenol (0.5 – 2%)	• Floor cleaning • Cleaning of toilets • Sputum of pots in TB labs
3.	Glutaraldehyde + diethyldioxydimethanol 1%	• Environmental surface cleaning in moderate and high risk areas
4.	Glutaraldehyde + diethyldioxydimethanol 0.5%	• Environmental surface cleaning in moderate areas
5.	Sodium hypochlorite solution Working concentration:0.1%-2%	• Environmental surface cleaning • Decontamination of suction jars, suction tubes, ventilator circuits, oxygen masks, nasal prongs • Blood and body fluid stained instruments and linens • To decontaminate soiled bed pan, toilet basin and commodes. • To disinfect colonized/ infected patient beds in isolation room after cleaning with detergent.
6.	Silver nitrate (0.01) +Hydrogen peroxide (11%)	• Fogging & Surface cleaning in High risk critical areas
7	Quaternary Ammonium component (3rd generation and Above)	• surface disinfectant, Floor cleaning, wet wiping in Moderate & High risk critical areas
8	Soap chips/detergents	• For general cleaning and floor cleaning in noncritical areas
9	Neutral soap-based low foam floor cleaner solution (Neutral Floor cleaner)	Soap-based neutral pH low foam cleaning • Liquid concentrate – floor cleaning. • For general cleaning and floor cleaning in noncritical areas
10.	1-propanol, 2-propanol+ethanol Spray	For Electronic Medical Equipments
11.	Alcohol Wipes (wipes soaked in propranolol/ethanol)	Scrubbing the hub of CL/IV canula prior to administration of fluids and medications
12.	Chlorhexidine 0.5%+ethanol 70%+ moisturizer	Hand rub
13	Chlorhexidine gluconate 2.5% + Ethanol 70%	• CL insertion site preparation • IV site preparation • Blood culture collection
14.	Chlorhexidine gluconate (4%) Body wash	• Cleaning of wounds • Surgical antisepsis • Preoperative bath

15.	Glutaraldehyde (2%) with activator and neutralization agent	• Instrument disinfectant
16	OPA<0.55%	• Only for High level disinfection of heat sensitive surgical instruments.
17	OPA strips	• For quality check of working solution of OPA disinfectant

1.4.2 Risk Categorization of Hospital Areas:

Hospital Environment should pose minimal risk to Patients, Staff and visitors.A functional area refers to any area in a healthcare facility that requires cleaning. Different functional area requires different cleaning frequency and monitoring. Accordingly, it is divided into

- High risk areas
- Moderate risk areas
- Low risk areas

High risk area	Moderate risk area	Low risk areas
OT/Recovery unit	Medical wards	Office areas
ICU/Cardiac care unit/NICU	Laboratory	OPD
HDU	Blood bank	Non sterile supply area
Emergency /Casualty	Pharmacies	Libraries
Labour room	Dietary services	Meeting rooms
Post Op unit	Mortuary	Stores
Surgical wards	Nurses/Doctors rest room	Telephone,electrical,Mechanical, External surroundings
CSSD	Rehabilitation areas	Staff areas
Radiation treatment areas	Psychiatric wards	
Chemotherapy ward/room		
Renal dialysis facility		
Isolation unit		

1.4.3 Frequency and methods for cleaning

Category	Frequency	Level of Cleaning	Methods of Cleaning
High risk areas	Once in two hours and spot cleaning as required	Cleaning and Intermediate level Disinfection	Cleaning with soap and detergent plus disinfection with alcohol compound, aldehyde compounds hydrogen peroxide and phenolics (not to be used in the nurseries)
Moderate risk areas	Once in four hours and spot cleaning as required	Cleaning and low level disinfection	Cleaning with soap and detergent plus disinfection with aldehyde compounds, hydrogen peroxide, phenolics
Low risk areas	For areas working round the clock at least once in a shift or in areas having general shift at least twice in the shift and Spot cleaning as required	Only cleaning	Physical removal of soil, dust or foreign material followed by cleaning with water and detergent

2. General principles of cleaning:

Environmental surfaces carry the least risk of disease transmission and can be safely decontaminated using less rigorous methods than those used on medical instruments and devices. Environmental surfaces can be further divided into:

● Medical equipment surfaces (e.g., knobs or handles on hemodialysis machines, X-ray machines, instrument carts, and dental units) and

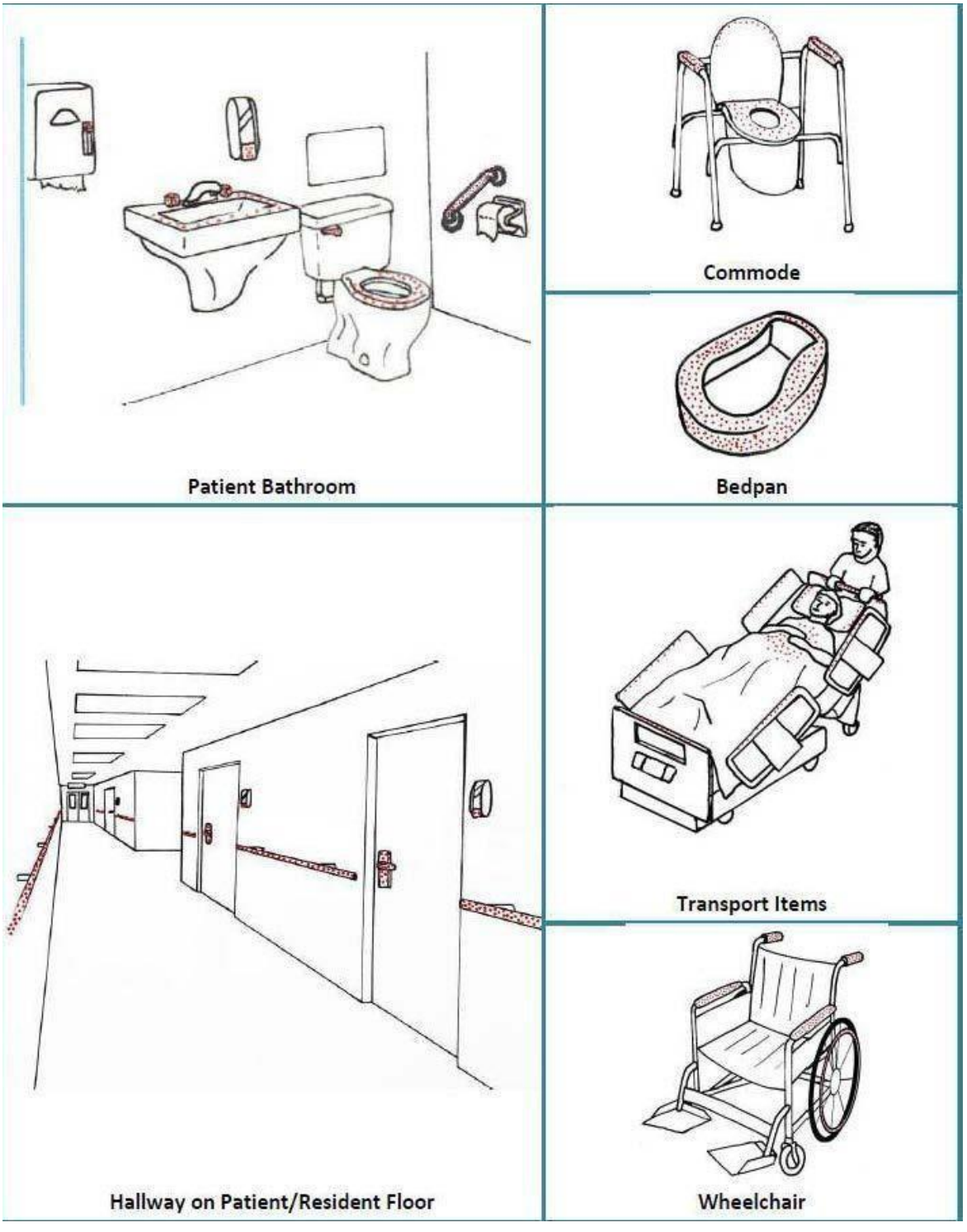
● Housekeeping surfaces (e.g., floors, walls, and tabletops).There are categorized ad

i) Low Touch Surfaces: Surfaces with minimal hand-contact

ii) High Touch Surfaces: Surfaces with frequent hand-contact

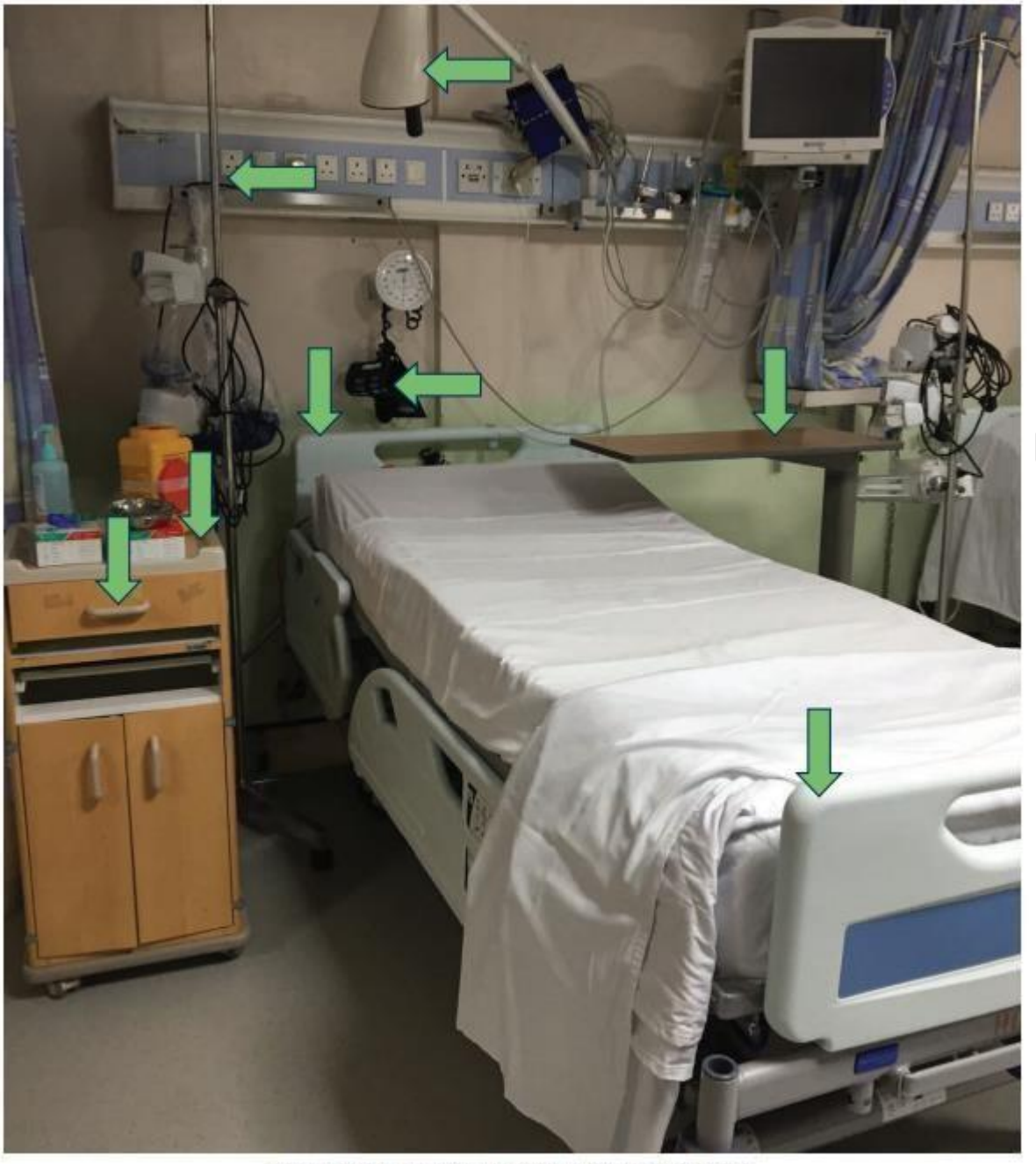
Low Touch Surfaces	High Touch surfaces
Floors, ceilings, mirrors, window sills, walls	Doorknobs, bedrails, light switches, elevator buttons, telephone, call bells, computer keyboards, monitors, haemodialysis machines, edges of privacy curtains, wall areas around the toilet in the patient's room

High touch areas



Example of high-touch surfaces in a specialized patient area

Source: CDC-Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings



High touch surfaces include, but are not limited to:

bed rails • bed frames • moveable lamps • tray table • bedside table • handles • IV poles • blood-pressure cuff

2.1 Procedure to clean Medical surface Equipment:

- Follow manufacturers' instructions for cleaning and maintaining noncritical medical equipment.
- In the absence of a manufacturer's cleaning instructions, follow certain procedures as detailed below.
- Clean noncritical medical equipment surfaces with a detergent solution.
- This may be followed with an application of intermediate/ low level surface disinfectant in accordance with disinfectant label instructions and after assessment of compatibility of the disinfectant with instrument.
- Do not use alcohol to disinfect large environmental surfaces.

Article	Method
Airways and endotracheal tubes	Single use or Heat disinfect in CSSD
Ambubag	Clean with detergent and water, dry and clean with 70% alcohol
Applicators (Tonometer Prisms)	Immersion in 0.05% hypochlorite for 10 minutes.
Arterial catheters	Sterile, single use only, must be discarded after use.
Baby weighing scales	A fresh liner should be used for each baby. Clean tray with detergent and water. Wipe with 0.1% Hypochlorite if contaminated.
Baby bath	Clean after each use with detergent and water
Beds and couches Frame	Clean with detergent and water between patients and as required If contaminated with body fluids or if used in isolation room after cleaning, should be wiped with any of the surface disinfectant (sodium Hypochlorit 0.1%)
Bedpans / urinals	Clean and disinfect with 0.1% sodium hypochlorite or hot water. Ensure that the item is dry before re-use.
Breast pumps	Wash with detergent and water and immerse in freshly prepared sodium hypochlorite 0.1% solution at least for 20 minutes.
Bowls (surgical)	Wash with detergent and water and send for Autoclaving
Bowls (washing)	Wash with detergent and water and decontaminate with 1% sodium hypochlorite, rinse and dry after each use. Store inverted and separated
Buckets	Clean with detergent and water and decontaminate with 0.5% bleaching solution, rinse and store dry.
Carpets	Vacuum daily Should be shampooed or steam cleaned in isolation rooms as a part of terminal cleaning.
Cheatle forceps	Autoclave daily and keep in fresh solution of 1% savlon (change solution daily) or Glutaraldehyde solution (2%)
Commodes	Seat and arms—clean with detergent and water, and dry. If soiled or used in isolation wards—wipe with sodium hypochlorite 0.5 % and dried, after cleaning

Couches (examination)	Cover with rubber mat followed by draw sheet between patients. Send to laundry after each day session, and the mattresses are cleaned with soap and water.
Cradles	Clean with detergent and water and dried. If contaminated use any of the surface disinfectant (sodium Hypochlorite 0.1% or Bacillocid 0.5%)
Cutlery and crockery	Should be heat disinfected in dishwasher. If washed in sink, wash with water and detergent.
Curtains	Should be changed as a part of rolling program by domestic services Should be changed as a part of terminal cleaning program.
Denture pots	. To be cleaned by patients themselves with detergent and water . Disposable with lid–single use.
Drainage bottles	. Disposable—Single use; discard after use. 2. Reusable—Wash with detergent and water, put jars in the disinfectant solution (1% hypochlorite). Leave for contact time (20 mins), rinse and store dry, or send to CSSD. Weekly autoclaving or HLD is highly recommended.
Dressing trolleys	Clean daily with detergent and water. After each use—wipe with 70% isopropyl alcohol.
Drip stands/IV stands	Should be cleaned with detergent and water and dried. After use in isolation, should be wiped with sodium hypochlorite 1% and dried after cleaning.
Dustbins	Detergent and water every morning
Ear Pieces for auroscope	Clean with detergent and water and dried.
Earphones	Clean with detergent and water and dried. Foam should be replaced after use in isolation.
ECG leads and machines	Wash with detergent and water and then wipe with 70% alcohol.
Leads and monitors	Dismantle to smallest components and clean with detergent and water and dry.
Furniture	Damp dusted with detergent and water.
Hemodialysis machines	Thoroughly clean between patients and disinfect at the end of the day as per manufacturer's recommendations. *Colonized/infected patients:* after cleaning with detergent, disinfect with hypochlorite (1000 ppm av Cl2) solution or other appropriate disinfectant as per manufacturer's recommendations.
Humidifiers	Clean and sterilize at low temperature by plasma/ ETO sterilizer/ immerse in glutaraldehyde solution (2%) for 10 hours. Water used in humidifiers—Use normal saline/ sterile distilled/ sterile tap water. Replace the water used daily/ for every patient. Humidifiers which are not in use should be cleaned and kept dry.
Infant incubators	Routinely wash with detergent and dry with disposable wipe in a daily basis. *Colonized/infected patients:* After cleaning, wipe with 70% isopropyl alcohol impregnated wipe or use hypochlorite (125 ppm av Cl2) solution. When the baby is discharged, dismantle incubator and wash *all removable parts* and clean with detergent and then disinfect with hypochlorite (125 ppm avCl2) solution or other disinfectant as per manufacturer's recommendation and allow to dry. The cleaning and disinfection should be done in a separate area.
Intravenous monitoring pumps (and feed	Clean the outer surface with detergent and water and dry. If used in isolation rooms, wipe with 1% sodium hypochlorite and dry.

Laryngoscopes	Clean with detergent and water and HLD is done with glutaraldehyde 2%. Bulb of the laryngoscope should be removed and cleaned with water and then wiped with 70% alcohol.
Locker Tops	Damp dust daily with detergent solution and allow to dry. *Colonized/infected patients:* After cleaning with detergent, disinfect with hypochlorite 1000 ppm av Cl2 solution or other appropriate disinfectant and allow to dry.
Mattresses and pillows	Clean with detergent and water between patients and as required. Should not be used if cover is damaged. Contaminated pillows must be discarded. Torn mattress covers must be replaced before mattress is reused.
Medicine trays	To be cleaned with detergent and water weekly. In case of blood spillage—follow spillage policy
Metal buckets	Clean with Vim powder every week
Mops	Disposable use for one day. Re-usable to be laundered.
Peak flow	Disposable—single patient use.
Nebulizers and tubing's	Cleaning and low temperature sterilization by plasma/ ETO/ immerse in Glutaraldehyde solution (2%)for 10 hours.
Proctoscopes	Disposable—single use; Re-usable to be rinsed and autoclaved.
Scissors	Surface disinfect with a 70% alcohol impregnated wipe before use. If visibly soiled clean first with a detergent solution. For sterile use, follow high level disinfection with 2% glutaraldehyde.
Sphygmo-manometer cuffs (BP apparatus cuffs)	Use dedicated items in high-risk areas (e.g., ICU) or patients known to be *colonized/infected.* Wash sleeve with soap and water once a week. In between patients Disinfect with 70% alcohol impregnated wipe to clean tubing and inflation bladder. After use in isolation, should be laundered in washing machine
Splints and walking frames	Wash and clean with detergent and allow to dry.
Sputum pots	Disposable with close fitting lid—should be discarded into clinical waste for incineration. Reusable– Pre-treat with 15ml hypochlorite then toilet flush the material. Clean the emptied pot with detergent and water and disinfect with 0.1% hypochlorite for 30 minutes before reusing.
Soap dispensers	Should be cleaned weekly with detergent and water and dried.
Stethoscopes	Surface should be wiped with 70% alcohol impregnated wipe between patients. Use dedicated stethoscope in high-risk area e.g., ICU. NNU or patients with infection or colonized with MDROs

Suction bottles	Disposable liners—must be sealed when 75% full and placed in yellow plastic bag. Re-usable (jar and tubing's): Should be cleaned with soap and water followed by 1% sodium hypochlorite and dried. To be stored dry when not in use. Must be changed daily and in between each patient. • At least weekly autoclaving of jars should be done whenever applicable. Minimum 1%–2% sodium hypochlorite solution should be kept in jar in volume which is 1/10 volumeof the jar. After use, add equal quantity of hypochlorite for disinfection at source before discarding the content.

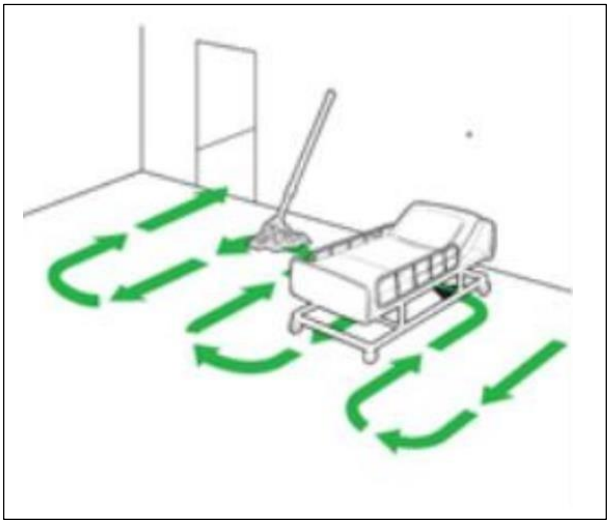
Surgical Instruments	Should be cleaned in multi enzymatic cleaning solutions at source. Transport cleaned instruments in closed rigid containers to CSSD for sterilization by autoclaving/plasma sterilizer/ETO. The instruments may be subjected to cleaning by automated washer-disinfectors or ultrasonic cleaners at CSSD if required.
Thermometer	*Oral: Single-patient use thermometers* must be dedicated for infection patients and patients in high- risk areas, e.g., ICU. They should be cleaned and wiped with a 70% isopropyl alcohol impregnated wipe after each use and stored dry. On discharge of patient, wash both thermometer and thermometer holder with detergent, immerse in 70% alcohol for 10min. Wipe and store dry. *Communal thermometers:* wipe clean, wash in a cold neutral detergent, rinse, dry and immerse in 70% isopropyl alcohol for 10 min. Wipe and store dry. *Rectal:* clean and wash in detergent solution after each use, wipe dry and immerse in 70% alcohol for10 min. Wipe and store dry. *Electronic:* where possible use a single-use sleeve. If not possible, use either single-use thermometer or clean and disinfect between use. Do not use without sleeve or on patients with an infectious disease. Single-use sleeve, single-patient use in high-risk areas or infected patient. Clean, then wipe with a 70% isopropyl alcohol impregnated wipe after each use. *Tympanic:* single-use sleeve. Disinfect in between patients by wiping with 70% alcohol
Telephones	To be wiped with70% alcohol
Toilet seats	To be cleaned at least twice daily with detergent.
Toys	Clean with detergent and water and dried.
Ultrasound machines	Damp dust with detergent solution and allow surface to dry before use. Draw up local protocol for cleaning and disinfection based on the manufacture's recommendations
Urine pots /Urine measuring jugs	Clean with detergent and water and disinfect with 0.1% hypochlorite for 30 minutes before reusing.
Vaginal speculae	After use immerse in hypochlorite for 15-30 min and Send to CSSD for sterilization or use single-use
Ventilator and breathing Circuits	Use single-use (disposable) tubing for every patient if possible or heat disinfect/ sterilize in CSSD.If re-used—Daily cleaning and disinfection of tubing must be done. After 72 hrs of use autoclaving should be done for autoclavable tubing's. After removing of ventilator tubes wash it with detergent and water and send to CSSD for autoclaving *Infected patients:* for patients with respiratory infection and other serious infection use disposable tubing. Never use Glutaraldehyde to disinfect respiratory equipment
Ventilators	After every patient, clean and disinfect ventilators. Dismantle and sterilize/disinfect (high-level) all re-usable components as per the manufacture's recommendations Humidifier water must be changed at least every 8 hrs.

Vomit bowls	Clean with detergent and water and disinfect with 0.1% hypochlorite for 30 minutes before reusing.
Wash bowls	Patients must have own dedicated bowl. After each patient's use, should be cleaned with detergent.
Wheel chairs	Patient's own—should be cleaned with detergent and water as necessary. Hospital—clean between patients with detergent and Water

2.3 Procedures for cleaning the surfaces for Housekeeping

- Progress from the least soiled areas (low-touch) to the most soiled areas (high-touch) and from high surfaces to low surfaces.
- Remove gross soil (visible to naked eye) prior to cleaning and disinfection.
- Minimize turbulence to prevent the dispersion of dust that may contain microorganisms.
- Never shake mops.
- Use dust control mop prior to wet/ damp mop.
- Wash the mop under the running water before doing wet mopping.
- Do not 'double-dip' cloths (dip the mop only once in the cleaning solution, as dipping it multiple times may recontaminate it).
- An area of 120 square feet to be mopped before re-dipping the mop in the solution.
- Cleaning solution to be changed after cleaning an area of 240 square feet.
- Where facility of laundering mops is not available, mops should be changed at following defined intervals:

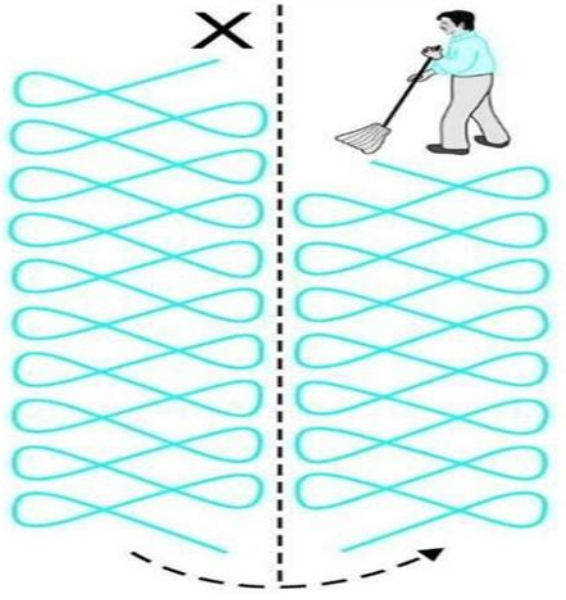
  High risk areas: In each shift
  Moderate risk areas: Each day
  Low risk areas: Every week
- Change cleaning solutions as per manufacturer's instructions. Change more frequently in heavily contaminated areas, when visibly soiled and immediately after cleaning blood and body fluid spills.
- Be alert for needles and other sharp objects. Safely handle and dispose sharps into puncture proof container. Report any incident to supervisor.
- Collect waste, handle plastic bags from the top (do not compress bags with hands).
- Clean hands on leaving the room.



2.4 Precedure for Mopping floors:

- Prepare fresh cleaning solution according to the manufacturer's instructions using appropriate PPE according to Material Safety Data Sheet (MSDS).
- Place 'wet floor' caution sign outside of room or area being mopped.

- Divide the area into sections (eg. Corridors may be divided into two halves, lengthwise, so that one side is available for movement of traffic while the other is being cleaned.)
- Immerse mop in cleaning solution and wring out.
- Push mop around skirting's first, paying particular attention to removing soil from corners; avoid splashing walls or furniture.
- In open areas use a figure eight stroke in open and wide spaces, overlapping each stroke; turn mop head over every five or six strokes.



- ❖ While in small spaces, starting in the farthest corner of the room, drag the mop toward you, then push it away, working in straight, slightly overlapping lines and keeping the mop head in full contact with the floor.
- ❖ For mopping of floors, 3 bucket system (as described below) should be preferred.
    - 1st Bucket with water: Dirty mop is rinsed
    - 2nd Bucket with fresh water for rinsing: Mop rinsed again in this water
    - 3rd Bucket with low level disinfectant: Mop is immersed in the solution and the floor mopped liberally.Wash the used mop with disinfectant after use and dry thoroughly before reuse.
    - Following things should also be considered while mopping the floors:
    - Prepare cleaning solutions daily or as needed and replace with fresh solution
    - Change the mop head at the beginning of the day and after cleaning up large spills of blood or other body substances.
    - Clean mops and cloths after use and allow drying before reuse; or use single-use, disposable mop heads and clothes.

Triple bucket mopping system:

3-Bucket System (Wringer Trolley)

OT Cleaning & Disinfection:

2.2 General principles for OT cleaning & Disinfection:

- Surfaces must be routinely cleaned first with detergent to remove any foreign and organic matter. Disinfection should follow cleaning. Do not apply disinfectant without cleaning as organic matter such as pus, blood , urine, amniotic fluid, etc. inhibits the action of the disinfectant by protecting microorganisms.
- Spills must be cleaned immediately. Apply higher concentration of disinfectant (0.05 % to 0.5% Sodium hypochlorite) to the spill, then clean with detergent.
- Disposable or freshly laundered washable cloths or mops should be used with freshly prepared solution for each task.
- OTs must be cleaned daily. This includes furniture, lights, equipment, windowsills, ledges, scrub rooms and sinks. Thorough cleaning of the entire OT should be done once a week.
- Do dry vacuum cleaning for dry floor cleaning. Brooming is not recommended.
- Wet vacuuming is the preferred method to clean the floors, wet mopping can be done if wet vacuum is not available.
- Collections of water should be dried immediately. Leaking faucets and sinks should be fixed as wet areas encourage microbial growth and can be a source of infection.

2.3 Daily cleaning procedure:

***Before start of the first case, at least one hour before*:**

- Damp dust with detergent.
- Disinfectant all equipment, furniture and lights.

Between cases:

- Place soiled towels, drapes and gowns in a clean laundry bag and send to laundry. Wet linen should be placed in plastic container so that bacteria do not pass through the moist material.
- Soiled instruments must be placed in disinfectant and then send to the cleaning area, this prevents occupational hazard to the cleaner.
- Wipe all used equipment, furniture and lights.
- Move operating table to one side and wet vacuum or wet mop a 3–4 feet area around the operating site.
- Empty suction bottle and wash the suction bottle and tubing with detergent–disinfectant. Best is disposable suction bottle.

Terrminal daily cleaning after scheduled cases are over:

- Remove all portable equipment from the room
- Wipe windowsills, overhead lights, equipment, furniture and waste containers with a cloth soaked in detergent and high level disinfectant solution.
- Wet vacuum or wet mop the entire floor area.
- Clean and disinfect the wheels.
- Restock unsterile supplies.
- Check levels and dates of all sterile supplies and restock.
- Clean scrub sinks with scouring powder.

2.4 Weekly general cleaning procedure

- Remove all portable equipment. Clean lights and fixtures with detergent disinfectant solution and cloth.
- Clean doors hinges and facings and rinse with solution.
- Wipe down the walls with a mop soaked in detergent disinfectant solution.
- Scrub the floor with floor cleaning machine and disinfectant detergent solution.
- Replace clean portable equipment, clean wheels and castors by rolling them across a towel saturated with detergent disinfectant.
- Wash and dry all furniture and equipment including
    - Operating room table
    - Suction holders
    - Foot and sitting stools
    - IV stands and all other stands
    - X-ray view boxes
    - All tables
    - Tubing to oxygen tanks
    - Waste containers and buckets

- Clean the air-conditioning grills.
- Empty all shelves, wipe with detergent–disinfectant and dry them before replacing the supplies

2.5 Fogging:

Indication of Fogging:

- If any infected case like anthrax, gas gangrene, tetanus or an open septic wound with laboratory evidence of *Clostridium tetani* surgery performed in operation room.
- Before functioning of a newly constructed or renovated or repaired operation room.

Requirements:

1. Fogger Machine
2. Water
3. Hydrogen Peroxide (11% w/v) and Silver Nitrate solution (0.01% w/v)

   To undertake Terminal Disinfection before fogging

   Calculate the area to be fogged in cubic feet

   i.e. Length X Breadth X Height

   Example: L= 10 ft, B=10 ft & H=10 ft

   Then cu. Ft area is 10 X 10 X 10=1000 cu. ft.

General instructions before fogging:

- Remove all the dust from area where fogging has to be carried out.
- Clean the room thoroughly and mop all the surfaces
- Before starting the fogging process room & all surfaces should be cleaned with disinfectant
- Labels should be put on the door with time of starting & expected time of opening
- Seal the room including windows and ventilators air tight.
- Use adhesive tapes to close the gaps.
- Keep air conditioning switched off.
- Switch on exhaust for 15 minutes prior starting air conditioning.
- Air conditioning to be started after 1 hour of the procedure.

Precautions to be taken during process of fogging

- Do not use flammable/non approved liquids in the fogging machine.
- Do not use machine without timer device.
- Never probe into front nozzle from where the mist comes out.
- Use funnel to pour the liquid in the machine tank.

- ❖ After completion of procedure add some plain water in the empty tank and fogger machine should be started for flushing.

Fogging procedure:

- ❖ Measure the area of room to be fogged in cubic feet.
- ❖ Disinfectant to be used as per the area size of O.T for allotted time
- ❖ For each 1000 cu.ft. (28.3 cu.mt.) space, use the approved high level disinfectant according to the manufacturers instructions.
- ❖ Pour this solution to fogging machine
- ❖ Switch on the machine
- ❖ Keep it for 60 minutes
- ❖ No neutralisation with ammonia required
- ❖ Appropriate use of PPE like gloves, masks and goggles etc
- ❖ Check all the activities are being carried out which were mentioned in the instruction for pre-fogging.
- ❖ Mark sure that no person will present in the area or room of fogging apart from the person who is carrying the fogging operation.

The person who is carrying out the operation should be aware of the fogger machine mechanism and handing of the fogging disinfectant liquid.

Microbiological Surveillance after Fogging

- Recommended only in case of fogging done after new construction/ renovation/ repair work or after procedures done on septic cases.
- Not indicated in case of fogging being done as a part of terminal cleaning. In such case the area/room can be used immediately after fogging.
- Surveillance cultures in the form of air sampling by open plate cultures (settle plates) and swabs for isolation of bacteria should be taken by a trained persons .
- Information regarding the same should be provided to infection control team prior to fogging.
- The area/room where fogging was performed should not be used until the microbiological surveillance cultures are reported as negative.

Action Plan in Case of Positive Microbiological Surveillance Report

- In case of positive microbiological sampling report, the area/ site should be cleaned and scrubbed thoroughly with soap/ detergent and water followed by cleaning with disinfectant (phenolic agents/ hypochlorite's). This should be followed by repeat fogging and repeat microbiological testing.

- OT/ room/ area can be used only after microbiological surveillance cultures are reported as negative.

3. Cleaning of Isolation room

i. Cleaning of this area should preferably be done after cleaning other areas

ii. Additional PPE – disposable cap, mask, linen gown and if required, goggles - should be used during cleaning. These items should be put on just before entering the area and should be removed immediately after coming out. They should not be taken to other areas of the hospital without putting them in plastic bag first

iii. Prepare all cleaning equipment and chemicals before starting cleaning. All cleaning should be completed in one session. Use an HLD

iv. Wear cap, mask, gown and rubber gloves

v. Enter the area. Keep door closed to prevent traffic. If patient has a respiratory infection, keep windows open

vi. Clean blood and body fluid spills first

vii. Remove all contaminated items and items to be replaced from the area – linen, curtains, waste, sharps containers, etc. Inspect the area to make sure no item is missed. Soiled linen should be put in plastic bags at the point of removal itself. Make sure sharps containers are closed tightly and handle carefully to prevent dropping the container. Segregate any waste at source by putting it into the appropriate container. Waste bags should be closed, tied and labelled before transport

viii. Change gloves and begin cleaning

ix. First clean and disinfect all patient care items dedicated to the area e.g., thermometers, blood pressure apparatus, tongue depressors, weighing scales, ambu bags, sterile containers placed in the area, etc. Do not take these to another location or use on another patient before they are cleaned and disinfected properly.

x. Begin cleaning the environment after this. General direction for cleaning – from clean to dirty and from top to down

xi. Begin cleaning from the periphery of the area e.g., clean doors, door handles, windows and walls first. Clean walls from top to down. Clean all wall mounted items (switches, hand rub bottles etc.).

xii. Next clean all floor-based items – lockers, chairs, IV stands, waste bins etc. Pay particular attention to high touch surfaces like handles, bedrails. Make sure all horizontal surfaces are cleaned

xiii. Clean the bed last

xiv. Clean any attached toilets next

xv. Lastly clean the floor

xvi. Gather used mops in a plastic bag to transport them to the cleaning and disinfection area. Mops and buckets used to clean this area should be cleaned and disinfected before using them in another area. Disinfectant bottles should be dedicated to the infected ward/rooms only and not used in other area

xvii. Disposable cap and masks should be removed immediately and discarded in the correct bio-medical waste container. Linen gown should be removed without touching the outer side and bagged as soiled linen

xviii. Wash and remove the utility gloves; wash hands with soap and water; disinfect them using an alcohol hand rub

xix. If any items are to be replaced in the area, do it now. Wear fresh PPE before entering the area
xx. Disinfect footwear by immersion in chlorine solution with 500-1000ppm chlorine for 5-10 minutes before using again. If they are soiled with blood and/or body fluids, first disinfect with chlorine solution before washing with soap and water using a brush .

Terminal Disinfection after Discharge of Infected Patients

Terminal disinfection of the room/ward should be done after discharge of infected patients. The aim of this procedure is to thoroughly clean and disinfect all items and surfaces in the room/ward (eliminate any reservoirs of infection) and prevent further transmission to patients admitted there and staff working in the area. Detailed cleaning and disinfection of all surfaces and removal/disinfection of all potentially infected patient care items (thermometers, stethoscopes, tongue depressors etc.) is very critical to reduce the risk.

Steps for terminal disinfection of an area:

i. Determine whether the patient was on any particular isolation precautions – contact/droplet/airborne. If so appropriate precautions should be taken during cleaning and disposal of waste.

ii. Prepare for cleaning – gather the cleaning equipment and items to be replaced. Once cleaning begins, the cleaning staff should not go to other areas of the hospital until all cleaning is finished

iii. Clean hands and use an alcohol hand rub

iv. Put on utility gloves. Wear a cap, mask and gown if patients were on isolation precautions

v. Walk through the area and make a list of items that should be replaced e.g., soap, empty alcohol hand rub bottles, towels, linen etc.

vi. Remove all contaminated items and items to be replaced from the area – linen, curtains, waste, sharps containers, etc. Inspect the area to make sure no item is missed. Soiled linen should be put in plastic bags at the point of removal itself. Make sure sharps containers are closed tightly and handle carefully to prevent dropping the container. Segregate any waste at source by putting it into the appropriate container. Waste bags should be closed, tied and labelled before transport

Clean any spills of blood/body fluid first

vii. Change gloves and begin terminal cleaning. Use a disinfectant. Use the pour wipes technique. Do not use plain water or only soap and water

viii. General direction for cleaning – from clean to dirty and from top to down

ix. Begin cleaning from the periphery of the area e.g., clean doors, door handles, windows and walls first. Clean walls from top to down. Clean all wall mounted items (e.g., switches, hand rub bottles, etc.).

x. Next, clean all floor-based items – beds, lockers, chairs, IV stands, waste bins etc. Pay particular attention to high touch surfaces like handles, bedrails, etc. Make sure all horizontal surfaces are cleaned

xi. Clean and disinfect all patient care items dedicated to the area e.g., thermometers, blood pressure apparatus, tongue depressors, weighing scales, ambu bags, sterile containers placed in the area, etc. Do not take these to another location or use on another patient before they are cleaned and disinfected properly

xii. Cleaning the bed

xiii. Check all sides of the mattress for soiling (replace the mattress if soiled)

xiv. Wipe mattress with disinfectant (if there is waterproof cover). Otherwise, soiled mattresses should be replaced. Wipe the removed mattress with plenty of disinfectant and keep in bright sunlight until thoroughly dry. Thereafter check whether it is usable. If not discard the mattress

xv. Clean the entire bed (i.e., frame, side rails, wheels, etc.)

xvi. Clean any attached toilets next

xvii. Lastly clean the floor

xviii. If possible, clean and disinfect the used mops now. If not possible, keep them aside for later cleaning and disinfection. Mops and cleaning equipment used to clean an infected area should be cleaned and disinfected before using them in another area

xix. Cap, masks and gown used for infected area cleaning should be removed using proper technique and bagged as soiled linen

xx. Wash and remove the utility gloves and wash hands with soap and water

xxi. Disinfect hands with an alcohol hand rub

xxii. If fogging is to be done, go to the next step; otherwise proceed to one step after that

xxiii. Use the same OT HLD to fog the area. Close all doors and windows and cover electrical equipment with plastic covers. Run the fogger until a fog is seen in the air. Then turn off the machine, remove from the area and keep the area closed for at least one hour. Post a sign on the door and mention the hour until which the area should be kept closed on the sign

xxiv. When room is cleared to enter again, replace the linen, towels, waste collection bags and any other materials

xxv. Inspect the area for cleanliness and check that all replaceable items have been replenished.

7. Spillage Management

Management Of Spills of Blood and OPIM (Other Potentially Infectious Material)

1. Blood and body fluid spillages should be dealt with immediately or as soon as it is safe to do so.
2. Other persons should be kept away from the spillage until the area has been cleaned and dried.
3. Care should be taken if there are sharps present and should first be disposed off appropriately into a sharp's container.
4. Spills should be removed before the area is cleaned.
5. Area should be well ventilated if using chlorinating agents.
6. Adding liquids to spills increases the size of the spill and should be avoided.
7. Chlorinating agents should be used in a well-ventilated area and are generally only recommended on a small spill.
8. Chlorinating agents should not be placed directly on spillages of urine.
9. Chlorinating agents are not suitable for use on soft furnishings.
10. It is recommended that supplies of personal protective equipment, paper towels and healthcare risk/ yellow waste bags are available for spills management.
11. If non-disposable cloths/ mops are used to clean spillage area they must be thermally or chemically disinfected.
12. Every patient care area must prepare the spill management kit.
13. The kit should be prominently labelled and placed at the most accessible site.
14. The kit contents should be reviewed daily to ensure completeness of the kit.
15. The spill kit must be immediately replenished after use and stored at the original location after every use.

Contents of spill management kit

- Personal Protective Equipment Gloves–2 pairs (single use)

  Plastic Apron–1
  Face masks–2
  Caps–2 Goggle-1
  Shoe Covers–2 pairs
  Forceps

- Absorbent Material (Cotton/ Blotting Paper/ Tissue Paper)
- Yellow Biohazard bag
- Small card board Sheets
- Sodium hypochlorite solution (use Phenol/ Lysol in case of spill clean-up of urine)

Concentration of Commercialy Available Hypochlorite Solution	Required Working Concentration	To Prepare 1000 ml		To Prepare 500 ml		To Prepare 100 ml	
		Hypochlorite Solution (in ml)	Add Water (in ml)	Hypochlorite Solution (in ml)	Add Water (in ml)	Hypochlorite Solution (in ml)	Add Water (in ml)
5%	1%	200 ml	800 ml	100 ml	400 ml	20 ml	80 ml
	0.1%	20 ml	980 ml	10 ml	490 ml	2 ml	98 ml
	0.5%	100 ml	900 ml	50 ml	450 ml	10 ml	90 ml
	0.05%	10 ml	990 ml	5 ml	495 ml	1 ml	99 ml

Procedure of Spill clean up

1. Assemble materials required for dealing with the spill prior to putting on PPE.
2. Inspect the area around the spill thoroughly for splatters or splashes.
3. Restrict the activity around the spill until the area has been cleaned and disinfected and is completely dry.
4. Promptly clean and decontaminate spills of blood and other potentially infectious materials. Discard blood-contaminated items.
5. Use 0.05% Sodium hypochlorite for small spills and 0.5% hypochlorite solution for large spills. The detailed procedure is explained in the flow cart given below.

SPILL MANAGEMENT PROCEDURE (CDC Protocol)

Any spill, attend immediately, stop traffic, inform surrounding people

↓

Get the spill kit
Put biohazard signage board

↓

Wear gloves and other appropriate PPE from the spill kit

↓

Inspect the area around the spill thoroughly for splatters or splashes

↓

If spill contains broken glass material, collect the glass particles with the help of cardboard sheets and forceps and discard in sharps container.

↓

Confine the spill by placing absorbent cloth or paper

↓

Remove the absorbent cloth with help of scoop and scrapper and discard in yellow BMW bag

↓

Clean the area with minimal soap and water

↓

Pour hypochlorite solution over spill area and wait for 10 minutes

LARGE SPILL (>10 ML)	SMALL SPILL (<10 ML)
0.5% HYPOCHLORITE SOLUTION	**0.05%** HYPOCHLORITE SOLUTION

↓

Clean the area with plain water or regular disinfectant
Remove signage board

↓

Clean the equipment with soap water Then disinfect with 0.5% hypochlorite solution

↓

Remove PPE and discard in appropriate bins

↓

Perform hand hygiene with soap and water

↓

Replace the items in the spill kit and keep ready

How to clean a Blood Spillage (Picture Source: Modules And Resources In Health Care Facilities In Low- And Middle-Income Countries Environmental Cleaning And Infection Prevention And Control)

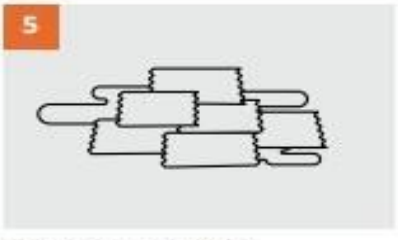
Materials:
Detergent solution, chlorine-based disinfectant solution, buckets for water, warning sign, PPE, infectious waste bin/bag, laundry container, mop, cloth, absorbent material, manufacturers' instructions

Perform hand hygiene

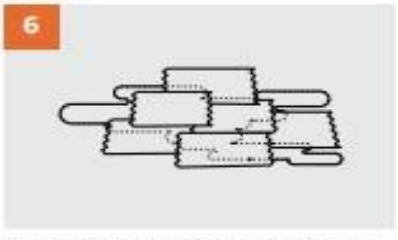
Put on apron/gown

Put on gloves

Position warning/hazard signs appropriately



Cover the spillage with absorbent material*



Allow the spillage to be absorbed into the material

Gather the infectious absorbent material

Dispose of immediately as infectious waste

Dampen a cloth or mop in detergent solution and go over the area to clean it

10

Dispose of cloth as contaminated or soiled for laundering

11

or immediately as infectious waste

12

Dampen a cloth or mop in chlorine-based disinfectant solution and go over the area again, then rinse area with water and allow the area to dry. Dispose of cloths in infectious waste or for laundering

13

Remove warning/hazard signs

14

Remove PPE and dispose of single use PPE safely in the waste bin/container

15

Clean and dry equipment, or leave to dry

16

Store equipment appropriately in dry a store room

17

Perform hand hygiene

Management of Mercury Spill

Contents of a Mercury Spill Kit:

1. Gloves
2. Mask
3. Goggles
4. Syringe 5 ml or dropper
5. Plastic container with lid that seals
6. Adhesive plaster strips
7. Cardboard strips or chart paper pieces
8. Thick plastic bag
9. Torch Procedure

Procedure of Mercury Spill Clean Up

1. Evacuate the area.
2. Put on face mask.
3. Remove jewellery & wear gloves.
4. Locate Mercury beads and look for missing mercury beads.
5. Use syringe without needle/eyedropper and sticky tap.
6. Spread powdered Sulphur or Zinc stains to make mercury darker color.
7. Collect in a leak proof bag or container with seal properly
8. Cleaning of floor surfaces contaminated with mercury and cleaning of room surfaces.
9. All the mercury spill surface should be decontaminated with 10% sodium thiosulfate solution. Keep window open to ventilate after clean-up.
10. Label it properly: - "Hazardous Waste, Handle with Care", Date of Storage/generation, Name & address of hospital with contact number.
11. Hand over the kit to BMWM.
12. Doors and windows of the room to be kept open for 24 hours.

DON'Ts:

- Do not put contaminated items in the washing machine.
- Do not vacuum.
- Do not use a broom or brush.
- Do not pour mercury down the drain.
- Do not throw mercury or contaminated items in the garbage.
- Never continue Wearing shoes and clothing that might have been contaminated in the mercury spill.
- Never burn shoes, clothing, fabric or anything that has been contaminated with mercury.

Management of Chemical Spill

1. Isolate the area. Safety should be assessed and source of spill should be contained.
2. Follow the MSDS guidelines for specific instructions on different chemical spill age.
3. Clean the area with help of chemical spill kit

Contents of chemical spill kit:

1. Absorbent pads and rolls
2. Chemical neutralizer
3. PPE kit

• Chemical resistant safety gloves
• Safety goggles
• Apron
• Footwear
• Shoe cover
• Dust mask or respirator

4. Clean up material for spill

Broom, plastic dustpan and plastic tongs or scoop
Chemical resistant bin with closed fitting lid
Heavy duty plastic bags for wrapping contaminated PPE.

5. Neutralization: depending upon the nature of chemical.

- Universal spill absorbent: good for all solvents, bases and acids (exception – hydrofluoric acid)
- Acid spill neutralizers: sodium carbonate, sodium bicarbonate or Calcium carbonate • Alkali spill neutralizers: boric acid, Sodium bisulphate or oxalic acid
- Solvent or organic liquid absorbent: inert absorbent such as clay and sand 6. Inform the appropriate authority.

6. All the spill kits must be readily available with all departments especially where risk of spill is more, like laboratory, sample collection room, wards etc.

8. Laundry and Linen Management

INTRODUCTION

Hospital should have a policy for laundry infection control. It is important that linen is appropriately managed to ensure contamination does not occur as this can then lead to transmission of micro-organisms to people or the environment.

The purpose of this policy is the prevention of infection or injury in service users and healthcare staff involved in the use, handling or laundering of hospital linen.

CLASSIFICATION OF LINEN

For the purpose of infection control, linen can be classified as

- *Clean Linen:* Linen items that are new, have been processed or are otherwise clean and have not yet been used.
- *Used Linen:* Fouled or blood-stained linen from patients not considered to be infectious or have communicable diseases.
- *Infectious Linen***:** Linen from patients with known infectious etiology such as MRSA/ VRE/MDRO or any other infections such as HIV, HAV, HBV, HCV etc.
- *High Risk Group Linen***:** Diseases that can be transmitted through a low infectious dose of organisms, e.g Escherichia coli O157, shigellosis etc.
- *Infested Linen*: From patients infested with lice and fleas.

- The laundry should be informed before-hand to ensure proper arrangement for this type of linen.

- *Heat Labile Linen:* linen which is made from fabrics likely to be damaged by normal disinfection process, e.g. personal clothing.
- *For Category 4 Pathogens:* Linen originating from patients with these pathogens should be bagged in yellow clinical waste bags and incinerated, e.g., anthrax, viral hemorrhagic fever, bioterrorism agents.

FREQUENCY OF BED LINEN CHANGE

- Ideally it should be changed daily.
- Linen must be changed and laundered between patients and when visibly soiled.
- Immediately, when fouled.

Criteria for stock management of linen used for patient care

Guidelines for Implementation of "KAYAKALP" Initiative categorizes

A minimum requirement of 4 sets of linen in each area however 6 sets are preferable.

The distribution of the sets will be as follows:

- One already in use (on bed)
- One ready-to-use (in sub-store)
- One in-transit route to laundry or to the ward
- One in-washing cycle in the laundry
- Two in stock (in the central store
- Clean linen should be stored in a clean area of the ward in closed cupboard.They must be stored separate from used/ soiled linen.

INFECTION CONTROL PRACTICES FOR LINEN DISPOSAL

General Consideration

- All personnel involved in the collection, transport, sorting, and washing of soiled linen should be *adequately trained and wear appropriate* PPE.
- All workers must cover all lesions on exposed skin with waterproof plasters and wear appropriate gloves.
- Gloves used for the task of sorting laundry should be of sufficient thickness to minimize sharps injuries. They must have access to hand washing facilities.

If the laundry services is outsourced then it is important that the hospital administration should include the hospital linen policy in the contract-setting process for provision of such services.

Laundry Bags

- Single bags of sufficient tensile strength must be used
- Leak-proof containment is needed if the laundry is wet and can soak through a cloth bag. Only two-thirds of the bag be filled to allow secure closure.
- Bags containing soiled laundry should be clearly identified with labels containing site of origin and colour coding.
- HCWs may handle these items safely, regardless of whether the laundry is transported within the facility or destined for transport to an offsite laundry service.
- Infected linen should be placed in an impervious bag that can be emptied into a washing machine with no or minimal handling and the bag either decontaminated in the washing process or disposed of as infectious healthcare waste.

Segregation

Infectious linen should be *segregated at the point of generation and not at the laundry site*. All infected linen should be immersed in 1:50 Sodium hypochlorite for 30 minutes and then hand over to the Laundary agency.

Sorting

1. Soiled and infected linen must be handled with care at all times.
2. Linen should be placed into bags at the point of generation as soon as possible
3. Bags must be securely tied to prevent spill-over.
4. Rinsing soiled laundry at the point of generation should not be done.
5. Infectious linen must not be sorted and loaded into a washing machine with no or only minimal handling.

Transport

1. There should be separate, designated bags and storage receptacles for clean and used linen and must never be transported together.
2. Soiled linen in bags can be transported by cart.
3. Clean linen must be wrapped or transported in a closed container to prevent

inadvertent contamination from dust and dirt during loading, delivery, and unloading.

4. Trolleys should be cleaned and disinfected
    - After any spillage
    - After transportation of dirty laundry
    - Thorough cleaning with soap and water at least weekly

Storage

Clean linen should be stored in a clean area of the ward in closed cupboard.

DISPOSAL OF LINEN

Criteria for Condemnation

- There will be no more than three patches in any 35cm square
- No repairs or patches will be larger than 15cm square
- There will be no more than 5 patches over the entire piece of Linen

1. The linen that required to be disposed off must be disinfected and duly washed as soiled linen
2. After maintaining a log book for such linens, it should be shredded and then dispose off in yellow bag to bio medical waste collector for final disposal

LAUNDRY PROCESS

Linen and clothing used in healthcare facilities are disinfected during laundering and generally rendered free of vegetative pathogens (hygienically clean), but they are not sterile.

REFERENCES

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2. Management of Used and Infected Linen Policy, NHS Foundation Trust, 2016.
3. Kaya Kalp, National Guidelines for Clean Hospitals, 2015.
4. Swachhata Guidelines for Public Health Facilities, MoHFW Govt. of India, New Delhi, 2015

9. CSSD Work Protocol

Objective/ Purpose: To establish an overview of guidelines and safety awareness procedures in the sterile service department.

GENERAL GUIDELINES

1. All personnel must follow established workflow patterns.
2. Material Safety Data Sheets (MSDS) for all chemicals used in the sterile service department must be available in the department.
3. Employee must be trained in a safe work procedure and be aware of any relevant procedures, policies.
4. All employees must be trained in using appropriate personnel protective equipment designated for each area.
5. Employees must adhere to dress code and policies before entering and when leaving the area.
6. Employees must follow and practice hand washing guidelines (before and after each tasks) in accordance with WHO guidelines.
7. Eating and drinking is prohibited in all workspaces including supply storage, processing and decontamination sections
8. Visitors are prohibited from entering CSSD spaces without permission.
9. If visitors must enter restricted areas, appropriate attire is required and they should be escorted by CSSD staff.

PATIENT SAFETY

1. All CSSD personnel should be trained in Decontamination and Sterilization Practices.
2. Safe keeping of all items by ensuring that storage areas are kept clean, equipment is covered and preventive maintenance is performed on all equipment.
3. Assure there is no contamination of patient care areas during collection and transportation of contaminated items.

EMPLOYEE SAFETY

1. Prevent burn injuries when loading or unloading steam sterilizers and washer disinfectors by following procedure and wearing appropriate PPE.
2. Use care and caution when handling sharps.
3. When receiving or handling contaminated items, always wear the correct PPE for the task.

NOTE:

1. Use of electrical extension cords is prohibited in sterile service areas.
2. All employees must be aware of fire and safety regulations.
3. If spills occur, refer to Spill management protocol.

DEPARTMENT CLEANING PROCEDURE

OBJECTIVE/ PURPOSE: To ensure an acceptable level of hygiene and cleanliness throughout the CSSD area.

PROCEDURE

1. The CSSD will be cleaned in accordance with the cleaning schedule.
2. Cleaning will take place before work commences or after work is completed, in the case of a 24hour facility cleaning will be rotated through areas when work is not in progress
3. The cleaning schedule will specify frequency of cleaning
4. Designated cleaning equipment will be stored in a designated area for that area's use only.
5. Cleaning work will only be undertaken by staff trained to work in that area.
6. CSSD staff is responsible for making sure that all surfaces are clean.
7. All cleaning procedures and cleaning chemicals used in the department will be in line with Departmental recommendations.
8. The use of brooms is discouraged.

DEPARTMENTAL DRESS CODE

OBJECTIVE/PURPOSE: To ensure that staff are properly attired according to the requirements of their work area.

PROCEDURE

1. On entering the Sterile Service Department, all staff will change into departmental uniform provided in the changing area.

2. Staff moving into the wash area, who will be engaged in the handling and processing of incoming equipment, must use appropriate PPE.
3. When leaving the wash area staff will remove and discard the gown and gloves and wash their hands.

MANUAL DECONTAMINATION OF MEDICAL DEVICES

PURPOSE: To ensure that all soiled equipment returned to the CSSD is cleaned to an acceptable standard.

PROCEDURE:

When washing instruments manually, standard/ universal precautions must be applied at all times.

1. Only staff trained in decontamination should manually clean medical devices.
2. Maintain segregation of designated clean and other areas within the department.
3. Identify the correct process for the items to be decontaminated according to manufacturer's instruction.
4. Use and store all equipment, chemicals and materials in accordance with manufacturer's instructions and organizational policies and procedures.
5. Ensure that stock of chemicals and materials that are being accommodated is rotated so that oldest is used first.
6. Place Bio Medical Waste Containers in positions that will minimize hazards to staff and visitors.
7. Handle contaminated devices as little as possible.
8. Check instruments off against the checklist returned with the set and take notice of any comments made on the check list by the theatre team/user.
9. Identify if the medical devices can be decontaminated in the washer.
10. Identify items requiring special attention and handle in accordance with documented manufacturers' instructions.
11. Each instrument will be prepared for decontamination as follows:

a. Remove the protective outer wraps

b. If needles/blades are found, the instrument set should be set aside and the end user contacted to come and remove the sharps.

c. Sort Cannulated and solid devices.

d. Open all hinged instruments

e. Flush all Cannulated instruments with the pressure jet gun / syringe before and after brushing.

f. Pressure sprays can be used according to manufacturer's guidelines.

g. Disassemble all multi part instruments of Handle and process all devices in accordance with the manufacturers' instructions Keep sets of items being processed together where possible

12. Sinks and accessories must be cleaned at each water change
13. When cleaning manually, a pre-rinse, wash, rinse and drying process must be followed.
14. The water temperature should be according to detergent manufacturers' instructions.
15. Water and detergent should be measured according to manufacturers' instructions and should have the correct chemical mixture.
16. All devices being manually cleaned must be fully immersed in the washing water while being scrubbed.
17. Special attention must be paid to the joints of any jointed instrument and meticulous attention paid to the tips.

18. A clean soft brush or soft cloth /Sponge are required to clean the surfaces.

19. After decontamination, all devices must be visually inspected for soil, damage and functionality.

20. Dry items using a non-linting cloth.

21. Clean items should be stored and transported in such a manner that cross contamination is avoided.

22. Return cleaning equipment and cleaning materials in good working order and condition to the appropriate place after use.

PREPARE, LOAD AND OPERATE AUTOMATED DECONTAMINATION EQUIPMENT

OBJECTIVE: To ensure that medical devices/equipment are correctly prepared and loaded for decontamination.

PROCEDURE:

1. Identify the correct process for the items to be decontaminated following manufacturer's instructions

2. Staff working in this area will wear protective clothing at all times in compliance with the PPE guidelines.

3. Handle contaminated devices as little as possible.

4. Washer disinfectors will be prepared for use as described in the Working Instructions Manual. Follow manufacturers' instructions.

5. All equipment is transferred from the trolly to the work surface.

6. Each instrument will be prepared for decontamination same as manual cleaning.

7. Standardized washing and disinfecting processes should be used and validated.

8. Place instruments into a wash basket and check to ensure all items and parts are present.

9. Load items to be decontaminated in the correct position in baskets so that maximum exposure to the decontamination process is achieved on all surfaces of the instrument

10. Place heavier items at the bottom making sure that all surfaces can be reached by the spray jets

11. Detergents should be used according to washer manufacturers' instructions

12. A full-automated process should be used including pre-rinsing, washing, disinfection and drying.

13. Where more than one chemical is used in the automated washer disinfector, the tubing should be marked to indicate which chemical it carries.

14. Identify and follow operating instructions for washer disinfectors (W/D's) accurately

15. Maintain records of all items received and prepared for processing

PREPARE, LOAD AND OPERATE ULTRASONIC CLEANER

OBJECTIVE

To ensure that medical devices/ equipment's are correctly prepared and loaded for decontamination.

PROCEDURE

1. Maintain segregation of designated clean and other areas within the department.
2. Identify the correct process for the items to be decontaminated Equipment will be prepared for use as described in the Manufacturer's Guidelines.
3. Highly contaminated instruments should always be pre-cleaned in the ultrasonic bath as otherwise they cannot be properly cleaned in the washer-disinfector.
4. It is also recommended that all trays with instruments should be put through the ultrasonic cleaner at least once a week.
5. In the case of table top cleaners;

a. Fill the tank with RO water to the operating level.

b. De-gas the water as recommended by the machine manufacturer.

c. Add detergent, as per requirement.

d. Sort cannulated and solid devices. Avoid contaminating hands with soiled edge.

e. Open hinged items

f. Place the basket of instruments into the tank. Never put instruments directly onto the base of an ultrasonic washer.

g. Make sure that instruments do not stick out of baskets.

6. Only prescribed automatic cleaning agents should be used, enzymatic cleaners are recommended bearing in mind manufacturer's instructions.
7. Select a program or set the timer control to the time specified by the machine manufacturer.
8. After the cycle has been completed, remove the basket from the tank and rinse the items with clean, potable water-unless the machine has an automatic rinse stage, or the load is to be transferred directly into a washer/ disinfector for further processing.
9. Drain and dry the items using a non-linting cloth or mechanical drying system.
10. Drain the machine after completion of each cycle and left dry and empty until further use.

PACKING AREA OPERATION

OBJECTIVE: To describe the operation and procedure controls in the Packing Room.

PROCEDURE

1. After decontamination, all clean items are received into the packing area
2. Any item that is rejected due to evidence of residual blood, body fluid, stains are placed in a plastic bag and identified before being returned for washing again
3. Any item that is damaged or broken is sent for repair

STERILE PACKAGING

OBJECTIVE: To ensure that the correct materials are used and that items are correctly packaged in order to maintain sterility

PROCEDURE

1. Sterile packaging must provide protection against contamination during handling as well as providing an effective barrier against microbial penetration.
2. An ideal packaging should have the ability to allow sterilization agents to penetrate and then provide a barrier, which will maintain the sterility of the wrapped devices.
3. Use only medical grade packaging.
4. The type of packaging and the way you package the devices will determine if aseptic opening is possible in the operating theatre or the ward.
5. The packaging should protect the contents against damage during handling and transport.
6. The packaging should be able to withstand the conditions during the sterilization process such as pressure changes, high temperature and humidity
7. It is important that the following points are taken into consideration when choosing a tray/set and packaging method:

a. The type of pack.

b. The size and weight of items to be packed.

c. The number of times the pack will be handled before use.

d. The distance that packs will be transported.

e. Whether the storage system is open or closed.

f. The condition of the storage area (cleanliness, temperature, humidity).

g. The method of sealing packs.

8. The packaging should bear a clearly visible marking indicating whether or not the product has been through a sterilization process.
9. Packaging material used in steam sterilization must be able to withstand high temperatures, allow for adequate air removal, be flexible considering changes in pressure during the process, permit steam penetration to the pack's contents and allow for adequate drying.
10. Packaging materials used with low temperature sterilization processes (e.g., ethylene oxide and gaseous hydrogen peroxide processes) must have similar properties, particularly being compatible with the sterilization chemicals, moisture, pressure changes and temperature ranges.

MEDICAL GRADE SINGLE USE DISPOSABLE STERILIZATION WRAP

1. Double wrapping creates a package within a package.
2. Two sheets of wraps are used providing multiple layers of protection of surgical instruments from contamination. Double wrap = wrap and wrap
3. The use of two layers of wraps reinforces the strength of the packaging.
4. The double wrap with two sequential folds also affords a two-step unwrapping process which assists in aseptic presentation and creation of a sterile field for users in the operating theatre; the outer wrap is removed before entering the operating room or by an assistant.

5. Do not re-use single use packaging
6. Use a hospital grade masking tape and autoclave tape when using wrap
7. Do not write on packaging

DISPOSABLE PEEL-OPEN POUCHES AND REELS

1. Paper/Plastic peel-open packaging materials are suitable for steam and EO.
2. Peel-open packaging should not be used for heavy or bulky items because the seals can become stressed and rupture.
3. Pouches are available in many sizes.
4. The open end of the pouch is closed with a sealing device. It is essential that the heat sealer is functioning effectively in order to get an adequate seal.
5. The user can cut reels to any size needed, in which case both sides of the pack will need to be sealed by the user.
6. Peel-open packaging is useful when visibility of the contents is important.
7. When packaging items, care must be taken to leave a minimum of 1 inch (2.5cm) space between the end of the item and the seal of the pouch or reel in order to facilitate aseptic opening.
8. When double pouching, the inner pouch should be at least a size smaller than the outer pouch to prevent folding which may entrap air and inhibit the sterilization process. They must be packaged paper against paper, plastic against plastic in order to enable sterilant penetration.
9. A felt-tip, indelible, non-toxic ink marker can be used on clear plastic side of the pouch to label.

REUSABLE RIGID CONTAINER SYSTEMS

1. Sterilization containers are a durable sterilization packaging system constructed of a rigid material such as metal, or plastic.
2. A variety of sizes can accommodate a wide range of instrument sets. need to be disassembled and cleaned after each use, following the reprocessing instructions supplied by the container manufacturer.
3. Containers are classified as devices themselves and as such should be reprocessed after each use, not just wiped down. Containers must be cleaned in the same way as any other reusable device.

STEAM STERILIZATION PROCEDURE

OBJECTIVE/ PURPOSE: To ensure consistent sterilization of items through quality control checks of the autoclave to ensure that all reprocessed medical devices are sterilized to an acceptable standard and ready for use.

PROCEDURE

1. Check to ensure printer, recorder is working properly
2. The first cycle will be a “warm up” cycle.
3. On the second cycle place a Bowie and Dick Test Pack, in the warm empty chamber above the drain, on a pre-vacuum cycle.
4. Once the cycle has run record the Bowie and Dick test according to procedure.

5. If the Bowie Dick test result is a fail, repeat the test with a new Bowie Dick Test pack.

6. If the Bowie Dick test is still fail shut down the autoclave for repairing.

7. Run Biological indicator once a week, according to CDC Guidelines, in the first full load of the day as well as any load containing implants.

8. Record the result according to procedure.

9. Record contents of load, information must be detailed enough to allow for tracking and recall if necessary.

10. Label package according to policy.

11. Make sure each pack has a tracking label affixed.

12. Ensure that items being loaded are compatible with High Temperatures.

13. Process full loads—not overloaded— to limit the number of cycles you need to run.

14. Load items in a loose fashion to facilitate air removal, and steam penetration of all surfaces— do not stack items one on top of the other.

15. Packages must not be in contact with walls or ceiling of chamber or else damage from heat or moisture may occur.

16. Load baskets and carts in a manner that hands won't touch packs when removing the hot trolley.

17. On completion of cycle, 'cycle complete indicator' will appear, visually check the graph / printer to determine that all parameters have been met.

18. In the event of a cycle failure/ cycle aborted, the entire load will need to go through the full reprocessing cycle.

19. The person responsible for checking the load should sign their name on the printout before opening the sterilizer door.

20. Open the door while standing towards the side to avoid burns.

21. Put on heat resistant gloves and remove carrier from Autoclave.

22. Allow to cool for 10–15 minutes before storage or dispensing.

23. Do not touch hot packs

24. Inspect packages to ensure integrity and external chemical indicators have changed.

25. Record results in the register and file for each autoclave according to batch no.

LOADING AND UNLOADING ITEMS FROM THE AUTOCLAVE

OBJECTIVE/ PURPOSE: To ensure that items are correctly loaded and unloaded from autoclaves in order to maintain sterility.

PROCEDURE

1. Wear relevant protective clothing.

2. Load instruments sets flat in single layer.

3. Load soft packs on top shelf and large instrument trays on lower shelf.

4. Do not allow packs to touch top, bottom or sides of autoclave.

5. Do not compress pack.

6. Position peel packs on sides.
7. Do not overload
8. On completion of cycle record maintain according to policy.
9. Allow autoclave and packs to cool before handling.
10. Do not touch hot racks without heat resistant gloves.
11. Once cooled check for wet packs, tears, indicator changes etc.
12. Store according to policy

LOW TEMPERATURE STERILIZATION (H2O2) OBJECTIVE/ PURPOSE

To ensure that all soiled returned equipment is sterilized according to an acceptable standard and ready to use. To ensure the work environment is safe for all employees.

PROCEDURE:

1. Sort Items that cannot be processed in a Hydrogen Peroxide Plasma/ Vaporized Hydrogen Peroxide.
2. Any item that is not completely dry
3. Items or materials that absorb liquids
4. Items made from materials containing cellulose e.g., cotton, paper, cardboard, linens, gauze or items that contain wood pulp Inserting and removing cassettes/ cartridge:
5. Check item for damage
6. Do not remove cassette from plastic wrapper if indicator strip is red, which indicates that the cassette might have been damaged
7. Check expiry date of biological indicator/ monitor.
8. Daily biological monitoring is recommended.
9. Place biological monitor in a load in the sterilizer
10. Process biological indictor
11. Incubate biological indicator at temperature as recommended by manufacturer. Preparing Items for loading:
12. All items must be thoroughly cleaned and dried before packaging.
13. Use packaging and containers recommended by the manufacture.
14. Arrange items in such a way as to ensure sterilant will come into contact with all surfaces.
15. Do not allow any items to touch the walls or the door.

STERILE PACK STORAGE

OBJECTIVE/PURPOSE: To ensure the safe storage of all sterile packs until their release to other departments.

PROCEDURE

1. This is a clean area and should be kept clean and tidy at all times with limited access.
2. Ensure that stock is rotated and monitor stock levels.
3. Any member of the CSSD staff may issue out packs to customers, provided that all the checks have been carried out by the person releasing the goods.
4. Only CSSD staff should be allowed access to the storage area.
5. Doors and windows must be kept closed.
6. Temperature and humidity should be controlled.
7. The sterile storage area should be arranged to make it easy to identify packs and be well lit and easy to clean.
8. Surgical and medical supplies should be stored at least 25 cm from the floor, 45 cm from the ceiling and 5 cm from outside walls to allow for air circulation in the room and to prevent contamination during cleaning.
9. Follow a system of use the First in First out (FIFO) system. Rotate stock so that oldest items are used first.
10. Products should be stored away from direct sunlight and water.
11. Do not squeeze packs into tight spaces as this can tear the packaging
12. Cardboard boxes should not be used as storage containers because they release fibres, cannot be easily cleaned and sometimes have rough edges which can make holes in packaging.
13. The shelf life of a pack is dependent on packaging, handling and storage conditions.
14. The shelf life of a CSSD processed sterile item is based on events rather than time.
15. Expiration date is a reminder "Use Before"/ "Use First".
16. Events that can compromise the sterility of a sterile item include:

a. Holes or torn wrappers.
b. Broken or incomplete seals on laminated pouches
c. Items that have been dropped on a dirty surface
d. Elastic bands or tapes should not be used to bundle items

THE DELIVERY AND DISTRIBUTION OF PROCESSED ITEMS

OBJECTIVE/ PURPOSE: To ensure customers receive sterile items in a safe condition and ready to use.

PROCEDURE:

1. All items will be checked for sterility before they are released.
2. The following should be checked when deciding if the pack is still sterile:

a. Holes or tears
b. Wetness or stains
c. Broken seals

d. Dust

e. Evidence of crushing

3. All damage items are returned to the decontamination area.

4. Various methods can be used in the transport of sterile packaged items to their point of use.

5. Sterile supplies should be transported in covered or enclosed trolleys with a solid bottom shelf. The solid bottom shelf prevents microorganism on the floor being picked up by the wheels of the trolley and then spun upwards onto the sterile packs.

6. If items are placed inside plastic or paper bags, they should be arranged to prevent them from being crushed or damaged during transport.

7. Items must be placed onto a clean trolley that can be covered.

8. Trolleys must not be overloaded.

9. Soiled items must NOT be loaded onto the same trolley.

10. Loaded trolleys must not be left to stand.

QUALITY CONTROL

OBJECTIVE: To ensure that the CSSD provides a quality service

PROCEDURE AREA WHERE TO PERFORM TEST

Detail of Test Washing Area Checks that complete set have been received from user. Check detergent level on washer. Packing Area All instruments to be visually inspected for cleanliness/ functionality— deal with rejected items according to policy.

1. Check all instrument are present and packed correctly.

2. Place a chemical in-pack indicator.

3. Check the functioning of heat sealers daily.

AUTOCLAVE AREA

1. Physical monitoring of all sterilizers.

2. Perform daily Vacuum Tests on all steam autoclaves (BD).

3. Perform weekly Biological Tests on all sterilizers.

4. Check that all packs have external chemical indicators before loading into sterilizer.

5. Check that all parameters have been met on autoclave. Take a printout and keep for record.

6. All items that have residual moisture, tears or from a failed cycle are to be dealt with in accordance with policy. Sterile Store Area

7. Before releasing goods for delivery, check the packaging for damage.

8. Check the external chemical indicator to ensure that the pack has been through a sterilize

MONITORING STEAM AUTOCLAVES:

OBJECTIVE/ PURPOSE: To monitor that all steam autoclaves are functioning optimally.

PROCEDURE:

a. Monitoring includes all sterilizer components that track and record time, temperature and pressure during each cycle, printouts, gauges, round charts, etc.

b. Documentation of critical cycle parameters permits the earliest detection of equipment malfunctions since they can be evaluated when the cycle is in progress. Sterilization failure can be identified at a number of stages:

c. Autoclave parameters are not met

d. Biological Test shows growth

e. Bowie Dick Test Failure

f. Process Challenge Device or Load Control Failure

g. External Process Indicator Failure

h. Internal Chemical Test Failure

i. The ISO 11140-1 standard classifies indicators according to intended use or performance criteria as follows:

1. Class 1: Process indicators/ external indicators for use in specific tests/Bowie Dick
2. Class 3: Single parameter indicators/ respond to one parameter
3. Class 4: Multi-parameter indicators/ respond to 2 or more parameters
4. Class 5: Integrating indicators/ react to all parameters/ mirror the performance of biological indicators
5. Class 6: Emulating indicators/ react to all parameters/ verify specific cycle parameters

Bowie Dick Test (BD)

1. Bowie-Dick test should be run and documented at least daily before the first process load and after any steam autoclave shut-down.
2. This indicates if air is being removed completely from the autoclave.
3. The Bowie Dick is placed on a rack above the drain of the autoclave in an EMPTY load.
4. This test should be done daily in each machine, the machine must be warm.
5. There must be a complete, uniform color change which indicates a PASS.
6. A PASS indicates that the sterilization process was effective since it indicates no air was present.
7. An incomplete or no color change—FAIL.
8. A FAIL indicates air was present and sterilization was not achieved.
9. Repeat the test.

10. If results still show a FAIL do not use the autoclave.

11. The Autoclave number and test result must all be recorded in the record book provided.

12. A Process indicator is placed on the outside of each individual package to verify that the package has been exposed to a sterilization process.

13. Indicator should be clearly visible on the outside of the sterilized package. This helps differentiate sterilized from unsterilized items.

14. Fix the Process indicator tape or label on the outside of the package or rigid container, once it has been assembled for sterilization.

15. Color change according to the manufacturer's reference—Pass–Medical Device can be moved to the Sterile Storage Area for use

16. Color change not according to the manufacturer's reference—Fail–Medical Device should be reprocessed CSSD.

Internal Chemical Indicators (CI)

1. In-pack chemical indicator can detect sterilizer malfunction or human error in packaging or loading of the sterilizer.

2. Place the CI in an area of the package, instrument tray or rigid container in an area that is determined to be the densest part of each pack

3. Measure if sterilizing parameters have been met inside the pack

4. Color change even and according to the manufacturer's reference—Pass–Medical Device can be used

5. Color change uneven and/or not according to the manufacturer's reference—FAIL–Medical Device should not be used

6. Send back to Sterilization Department for reprocessing.

Biological Indicators (BI)

1. A biological indicator is a preparation of living spores which provide a defined resistance to a specified sterilization process.

2. A PASS indicates if sterilizing conditions are adequate to kill micro-organisms.

3. Non-pathogenic micro-organisms are used.

4. Manufacturer of the BI should provide data on the reliability, safety and performance characteristics of their product, as well as instructions for storage, handling.

5. A test must be performed once a week in each sterilizer.

6. Place the BI in a test pack, into the center of a FULL load.
7. After sterilization, retrieve the BI Test out of the pack.
8. Allow the BI to cool for 10 minutes after sterilization. (Note the BI contains a glass ampoule, which needs to cool prior to crushing and incubating)
9. Record the sterilizer, load and date on the BI label.
10. Send the BI to microbiology for incubation process.
11. Sterilization process was effective since it indicates no growth.
12. FAIL means color change/growth of microorganisms.
13. Indicates microorganism growth and sterilization was not achieved
14. If there is a BI failure on any load, the whole load must be recalled, repackaged and re- sterilized.
15. Results must be recorded and stored according to Hospital policy.

10. OCCUPATIONAL & NEEDLE STICK INJURY

Introduction:

Occupational exposures to potentially infectious clinical material are not uncommon in healthcare setting. A percutaneous injury (e.g., needle-stick or cut with a sharp instrument), contact with the mucous membranes of the eye or mouth, contact with non-intact skin (particularly when the exposed skin is chapped, abraded, or afflicted with dermatitis), or contact with intact skin when the duration of contact is prolonged (e.g. several minutes or more) with blood or other potentially infectious body fluids is termed as exposure. Standardized practices should be followed in all kinds of Accidental Exposure to Blood (AEB). Most important concerns after NSI is the risk of infection from blood borne viruses. of all, most important viruses are HIV, Hepatitis B virus and Hepatitis C virus

Post Exposure Prophylaxis (PEP)

"Post exposure prophylaxis" (PEP) refers to the comprehensive management given to minimize the risk of infection following potential exposure to blood-borne pathogens (HIV, HBV, HCV).

This includes:[1]

1. First aid
2. Counselling
3. Risk assessment
4. Relevant laboratory investigations based on informed consent of the source and exposed person.
5. Depending on the risk assessment, the provision of short term (4 weeks) of antiretroviral drugs
6. Follow up and support

"Exposure" which may place an Health care worker (HCW) at risk of blood-borne infection is as follows:

1. Per cutaneous injury (e.g. needle-stick or cut with a sharp instrument).
2. Contact with the mucous membranes of the eye or mouth.
3. Contact with non-intact skin (particularly if the exposed skin is chapped, abraded, or afflicted with dermatitis).
4. Contact with intact skin when the duration of contact is prolonged (e.g. several minutes or more) with blood or other potentially infectious body fluids.

Potentially infectious body fluids are:

- Blood
- Semen
- Vaginal Secretion
- Cerebrospinal fluid
- Synovial, pleural, peritoneal, pericardial fluid
- Amniotic fluid
- Other body fluids contaminated with visible blood

Risk of transmission of infection:

The risk of transmission of HIV infection following Needle Stick Exposure is around 0.3% and after mucous membrane splash to eye, oro-nasal is around 0.09%. For transmission of HBV is 6-30% and for HCV is 1-1.8% following the needle-stick exposure.[2]

Management after potential exposure with infectious body fluids:

Step 1: Management of Exposure Site: FIRST AID

a. After percutaneous Injury: If the skin is broken after a needle-stick or sharp instrument immediately wash the wound and surrounding skin with water and soap, and rinse**. Do not scrub. Do not use antiseptics or skin washes (bleach, chlorine, alcohol, betadine).**

b. **After a splash of blood or body fluids:**

i. To unbroken skin:

- Wash the area immediately
- Do not use antiseptics

ii. For the eye:

- Irrigate exposed eye immediately with water or normal saline.
- Sit in a chair, tilt head back and ask a colleague to gently pour water or normal saline over the eye.
- If wearing contact lens, leave them in place while irrigating, as they form a barrier over the eye and will help protect it.
- Once the eye is cleaned, remove the contact lens and clean them in the normal manner. This will make them safe to wear again.
- Do not use soap or disinfectant on the eye.

iii. For mouth:

- Spit fluid out immediately.
- Rinse the mouth thoroughly, using water or saline and spit again. Repeat this process several times.
- Do not use soap or disinfectant in the mouth.

Dos and Don'ts for the Exposed individual	
Dos	**Don'ts**
Stay calm	Do not panic
Remove gloves, if appropriate	Do not place the pricked finger into the mouth
Wash exposed site thoroughly with running water and soap	Do not squeeze blood from wound
Irrigate thoroughly with water, if splashes have gone into eyes and mouth	Do not use bleach, alcohol, iodine, antiseptic, detergent etc.
Consult the designated physician/ personnel immediately as per institutional guidelines, for management of occupational exposure	

Step 2: Establish eligibility for PEP

Eligibility for PEP is determined by:

a. Source HIV status: Assessment for eligibility should be based on the HIV status of the source whenever possible and may include consideration of background prevalence and local epidemiological patterns.

b. Type and severity of exposure: Exposures that may warrant HIV PEP include:

- Type of body fluids: blood, bloodstained saliva, breast milk, genital secretions and cerebrospinal, amniotic, peritoneal, synovial, pericardial or pleural fluid. While these fluids carry a high risk of HIV infection, this list is not exhaustive. All cases should be assessed clinically, and health workers should make decisions as to whether the actual exposure constitutes a significant risk.
- Types of exposure:
    - Mucous membrane: sexual exposure; splashes to eye, nose, or oral cavity
    - Parenteral exposures: an accident with a high calibre needle (>18 G) visibly contaminated with blood
    - A deep wound (haemorrhagic wound and/or very painful); transmission of a significant volume of blood
    - An accident with material that has previously been used intravenously or intra-arterially

Exposures that do not require HIV PEP include:

- When the exposed individual is already HIV positive
- When the source is established to be HIV negative
- Exposures to bodily fluids that do not pose a significant risk, i.e., tears, non-blood-stained saliva, urine, and sweat

- Exposure to intact skin (unless abraded or inflicted with dermatitis)

*Ascertainment of source HIV status may be difficult in some settings. In settings with high background HIV prevalence or where the source is known to be at high risk for HIV infection, all exposure may be considered for post-exposure prophylaxis. PEP initiation should never be delayed due to unavailability of the source's HIV test results.

Step 3: Counselling for PEP

For an informed consent, exposed persons (clients) should receive appropriate information about what PEP is and the risk and benefits of PEP. It should be clear that PEP is not mandatory. The client should understand details of window period, baseline test, drugs that are used, their safety and efficacy and issues related to these drugs during pregnancy and breast-feeding.
He/she should be counselled on safe sexual practices till both baseline and 3 months HIV test are found to be negative.

Psychological support: Many people will feel anxious after exposure. Every exposed person needs to be informed about the risks and the measures that can be taken. This will help to relieve part of the anxiety, but some may require further specialized psychological support.

Step 4: Laboratory evaluation

HIV, HBV and HCV testing of exposed person should be done as early as possible. The decision whether to test for HIV or not should be based on the informed consent of the exposed person. A positive HIV status at baseline indicates need for referral to HIV care and treatment.

The following tests are done for both source and HCW for baseline Anti- HIV antibody, HbsAg detection and Anti HCV antibody detection. The test format should be a rapid method [immunochromatographic test or flow through assay or an Enzyme linked Fluorescent Assay] and the result should be available within 1-2 hours.

- Anti-HIV antibody detection
- HBsAg detection
- Anti-HCV antibody detection
- Anti-HBs antibody (done for HCW if previously vaccinated with 3 doses of HBV and titer not tested or tested but not documented).
  - ❖ **Baseline serostatus**: It is recommended that HCWs baseline serostatus should be obtained within 6 days of exposure.
  - ❖ Baseline serostatus is determined because later it may be difficult to attribute whether the infection was acquired due to the presence of occupational exposure or any other prior exposure
  - ❖ This may guide while taking decision, if the HCW claims for compensation from the health authorities.

Step 5: Prescribing PEP

- Timing of PEP: As post-exposure prophylaxis (PEP) for HIV has its greatest effect if begun within 2 hours of exposure, it is essential to act immediately. There is little benefit if >72 hours have lapsed but PEP can still be used if the health care worker presents after 72 hours of exposure. The prophylaxis needs to be continued for 28 days.
- A 28-day prescription of antiretroviral drugs should be provided for HIV post-exposure prophylaxis following initial risk assessment.
- Report exposure immediately to appropriate authority. Never delay the start of therapy due to debate over regimen. In cases with exposure from person on ART, start available three drug regimens and seek opinion after that. In case of highly treatment experienced source, initiate first dose as per guidelines and expert opinion should be sought.

Step 6: Follow-up

Follow up testing of the exposed HCWs is necessary if the source status is positive/unknown.

- ❖ Clinical follow up: Exposed healthcare worker is monitored for the eventual appearance of sign indicating HIV seroconversion-acute fever, generalized lymphadenopathy, cutaneous eruption, pharyngitis, non-specific flu symptoms and ulcer of the mouth and genital area. These symptoms appear in 50-70% individuals with a primary acute HIV infection, almost always 3-6 weeks after exposure.
- ❖ Laboratory follow up
    - For HIV testing the follow up is done at 6weeks, 3 month 6 months after the exposure
    - For HBV and HCV testing follow up is done at 6 months after exposure.
    - Liver function test at baseline i.e. start of the PEP for HIV.
    - CBC and Haemoglobin estimation at baseline (start of PEP HIV) and then at the end of 2^{nd} and 4^{th} week of PEP for HIV

Enhanced adherence counselling is recommended for individuals initiating HIV post exposure prophylaxis.

Follow-up client at 7 days, 14 days, 28 days and 12 weeks after starting PEP.

Follow-up HIV testing at 4 weeks, if negative, test again at 12 weeks after which test as per risk category.

Assess for and manage adverse effects due to PEP.

Monitor for acute sero-conversion illness, within 3-6 weeks after exposure. If suspected, refer to treatment services.

Assessment of the exposed individual:

The exposed individual should have confidential counselling and assessment by an experience physician.

The exposed individual should be assessed for pre-existing HIV infection intended for people who are HIV negative at the time of their potential exposure to HIV.

Exposed individuals who are known or discovered to be HIV positive should not receive PEP. They should be offered counselling and information on prevention of transmission and referred to clinical and laboratory assessment to determine eligibility for antiretroviral therapy (ART).

Besides the medical assessment, counselling exposed HCP is essential to allay fear and start PEP (if required) at the earliest.

Counselling for PEP:
Exposed persons (clients) should receive appropriate information about what PEP is about and the risk and benefits of PEP in order to provide informed consent.
It should be clear that PEP is not mandatory.
Informed Consent.
Psychological support: Many people will feel anxious after exposure. Every exposed person needs to be informed about the risks and the measures that can be taken. This will help to relieve part of the anxiety, but some may require further specialized psychological support.
Documentation on record is essential. Special leave from work should be considered for a period of time e.g. 2 weeks (initially) then, as required based on assessment of the exposed person's mental state, side effects and requirements.

PEP Prescription:

PEP must be initiated as soon as possible, preferably within 2 hours

Exposed person	Preferred regimen for PEP	Alternate regimen (if preferred regimen is not available or contra-indicated)
Adults and adolescents (≥ 10 years old and ≥ 30 kg body weight)	Tenofovir (300 mg) + Lamivudine (300 mg) + Dolutegravir (50mg) (one tablet OD)	Tenofovir (300 mg) + Lamivudine (300 mg) (FDC – one tablet OD) + Lopinavir (200mg)/Ritonavir (50mg) (two tablets BD) or Tenofovir (300 mg) + Lamivudine (300 mg) + Efavirenz (600mg) (one tablet OD)
Children (weight ≥20 Kg and age ≥6 years	Zidovudine + Lamivudine (dosage as per weight band)** + Dolutegravir (50mg) (one tablet OD)	If Hb <9 gm/dl: Abacavir + Lamivudine (dosage as per weight band) + Dolutegravir (50mg) (one tablet OD) or Zidovudine + Lamivudine + Lopinavir/ Ritonavir (dosage as per weight band) **
Children (weight <20 Kg or age 6< years)	Zidovudine + Lamivudine + Lopinavir/ Ritonavir (dosage as per weight band) **	If Hb <9 gm/dl: Abacavir + Lamivudine + Lopinavir/ Ritonavir (dosage as per weight band) **

Availability of PEP drugs:
PEP drugs are required on an urgent basis after accidental exposure and should be available and accessible round the clock. In all cases, the first dose of PEP should be offered as soon as possible, preferably within 2 hours, once the decision to give PEP is made. The PEP regimen should be made available from ARV drug stocks, in emergency ward, with proper documentation. A regular check should be made for expiry of drugs with replacement of short expiry drugs.

Documentation:
PEP cases should be documented in accidental exposure form (including consent form) and PEP register and reporting of drug consumption should be done.

Prophylaxis for Hepatitis B Virus

Pre-Exposure Prophylaxis for Hepatitis B Virus

Routine vaccination against HBV is mandatory for the HCW since they are at higher risk of exposure to HBV infection than the general population as they are more likely to come in contact with blood, body fluids or sharps. After 1-2 months of completion of three dose Hepatitis B vaccination series, HCW should be tested for anti-HBs titres. A seroprotective level of anti-HBs after

completion of a vaccination series is defined as anti-HBs ≥10 mlU/mL; a response < 10 mlU/mL is inadequate and is not a reliable indicator of protection.

Post-Exposure Prophylaxis For Hepatitis B Virus

If the source is KNOWN or SHOWN to be positive for Hepatitis B surface antigen (HBsAg), the level of exposed HCW anti-HBsAg antibodies titre is important.

1. If the injured HCW is immunized (anti-HBs antibodies > 10 IU/mL), whether from vaccination or past infection they are protected, and there is no need for Hepatitis B immunoglobulin after a potential or confirmed exposure to Hepatitis B.

2. If the HCW is unimmunized or a non-responder (did not seroconvert to the vaccine) or has antibody levels to HBsAg less than 10 IU/mL), and sustains a needle-stick injury from a patient with evidence of chronic HBV (HBs Ag positive), ***they should be given HBIG (hepatitis B hyperimmune globulin) 0.06ml/kg as soon as possible, preferably within 24 hours and should simultaneously start/reinitiate the course of HBV immunization with three- dose of hepatitis B vaccine at a different site for unimmunized/previously unfinished second hepatitis B series.*** The second and third doses should be separated by at least 2 months interval. If the HCW has had two series of the HBV vaccine and was still a non-responder, they should receive a second dose of HBIG, 1 month after the first dose. Following completion of 3 dose vaccination series, the level of immunity (antibodies to surface antigen i.e. anti-HBs titres) should be checked 1-2 months later. Those whose anti-HBs titres are <10mIU/ml should complete a second 3- dose vaccine series or be evaluated for HBs Ag positivity. If HBsAg is positive after exposure, the person should be counselled regarding the modes of prevention of HBV transmission to others and to seek treatment for HBV.

Post exposure prophylaxis for percutaneous or per mucosal exposure to hepatitis B virus

Vaccination/Serostatus	Source HBs- Antigen positive	Source HBs- Antigen negative	Source unknown
Unvaccinated	Hepatitis B immunoglobulin(HBIG) single dose and initiate vaccination	Initiate Vaccination	Initiate Vaccination
Responder to vaccine/Protected	No treatment	No treatment	No treatment
Non responder After one series (3-dose) of vaccination	HBIG single dose and initiate revaccination	No treatment	If source known to be high-risk: treat as if source were HBsAg- positive (HBIG single dose and initiate revaccination)
Non responder After 2 series (6 doses) of vaccination	HBIG two doses (separated by 1 month)	No treatment	If source known to be high-risk: (treat as if source were HBsAg-positive) HBIG single dose and initiate revaccination
Antibody response unknown	Test exposed person for anti-HBs: If ≥10 mIU/mL: no treatment If <10 mIU/mL: HBIG single dose and vaccine booster	No treatment	Test exposed person for anti-HBs If ≥10 mIU/mL: no treatment If <10 mIU/mL: initiate revaccination

Exposure to Hepatitis C virus:

Hepatitis C virus infection may lead to development chronic liver disease in majority of cases if not treated. Depending on whether active viral replication is occurring for Hepatitis C, the risk of transmission after a sharps injury from an HCV infected person varies from 1-1.8%. No post exposure therapy is available for hepatitis C, but seroconversion (if any) must be documented. ***The exposed HCW should be retested for HCV antibodies at 3 and 6 months with monitoring of clinical signs and symptoms***. Preferably the exposed HCW should be under the care of a hepatologist/physician so that HCV infection if happens is detected at the earliest (Liver enzymes monitored and in case these increase that may indicate infection) and treatment for HCV can be instituted. Standard precautions and other infection control practices should be followed. For any occupational exposure to blood borne pathogens, counselling and appropriate clinical and serological follow-up must be provided.

ANNEXURE I

PROFORMA

Needle Stick Injury And PEP

AIIMS Guwahati

Date:_____ **Registration No_____**

Doctor's detail who has examined the patient:
Name_____
Designation_____

Nodal Officer for PEP & NSI:
XXXXXXXXXXXXXXX
Department of XXXXXXXXX
AIIMS Guwahati
Contact Number: +91-XXXXXXXXXX

PLEASE DON'T GIVE THIS PROFORMA TO THE PATIENT
KEEP THIS FILLED UP PROFORMA IN THE FOLDER

This Proforma to be filled up for all cases of needle stick Injury or other Injury occurred inside the hospital that having the potential of infection transmission

Patient's Detail:

Name:.....

Age ..... Sex.....

Designation:.....

Contact number:.....

Department where posted.....

Signature.....

Exposure History Details

Date and Time of the Exposure:.....

Place of exposure (Department, Ward, ICU etc):.....

Time since exposure to reporting: .....

Type of Contact:.....

a) Penetrating wound b) Abrasion c) Mucosal Exposure d) Intact skin

e) Other (specify).....

In case of injury with instrument, specify the instrument:

a) Hollow Needle b) Solid Needle c) Scalpel or other surgical Blade

d) Other Specify:.....

Purpose of sharp item used……

When did injury occurred?

a. Before the use of instrument b. During the use c. After the use of instrument.

Source of Potential Infectious Material:.....

a) Blood b) Blood Mixed Body fluid c) Blood stained instrument or material

d) Body Fluid e) Unknown f) Other Specify.....

Injury Details

Site of the injury:.....

Type of injury:.....

Circumstances that causes injury……..

Vaccination status

(Of the exposed patient)

Hepatitis B Vaccination (*Tick mark the appropriate statement*):

a) Vaccination completed and titre is known to be more than 10 units
b) Vaccination completed but titre is not known.
c) Incomplete Vaccination.
d) Not Vaccinated
e) Not know whether vaccinated or not.

Source Patient Details

a) Source patient **Known / Unknown**

b) Source from (department, ward etc).....

c) If source patient is known then complete the details of the source patient *(Tick mark the appropriate result)*:

a) HBsAg- Reactive/ Non-Reactive/ Unknown.

b) Anti HCV- Reactive/ Non-Reactive/ Unknown.

c) HIV I&II- Reactive/ Non-Reactive/ Unknown.

Viral Marker Report of Exposed Patient

a) HBsAg- Reactive/ Non Reactive/ Unknown.

b) Anti HCV- Reactive/ Non Reactive/ Unknown.

c) ICTC- Reactive/ Non Reactive/ Unknown.

HIV Exposure Code- A. EC1. B. EC2. C. EC3

HIV Source Code- A. HIV SC1. B. HIV SC2. C. HIV SC unknown

TREATMENT

(Tick Mark the appropriate Points)

(Kindly consult the PROTOCOL BOOK for appropriate treatment option)

a) First Aid with counselling
b) Injection Tetanus Toxoid
c) Hepatitis B Immunoglobulin with First dose of Hepatitis B Vaccination
d) Hepatitis B Immunoglobulin with Booster dose of Hepatitis B Vaccination
e) PEP for HIV given
f) Others (specify).....

Follow Up

A. Person taking PEP for HIV:

Week 2 and 4: LFT, Complete blood count, RBS, KFT.....

Week 6: HIV-Ab.....

Month 3: HIV-Ab, Anti HCV, HBsAg.....

Month 6: HIV-Ab, Anti HCV, HBsAg.....

B. Person not taking PEP for HIV:

Week 2 and 4: Clinical Monitoring.....

Week 6: HIV-Ab.....

Month 3: HIV-Ab, Anti HCV, HBsAg.....

Month 6: HIV-Ab, Anti HCV, HBsAg.....

Any Drug Reactions or Adverse Reaction:

.....

.....

.....

.....

.....

Consent for Post Exposure Prophylaxis

I …….…….. s/d/w of ……..a resident of ……hereby declare that I voluntarily give my consent to get the PEP for hepatitis B/ hepatitis C/ HIV after understating the nature of injury I suffered and the possibility of transmission of hepatitis B, hepatitis C and HIV infection.

I have been informed in the language I understand about the nature of the injury I suffered and the possibility for transmission of hepatitis B, hepatitis C and HIV infection. I also understand the limitation of the post exposure prophylaxis in the prevention of the above mentioned infections and also the side effect and expected complication of the treatment. I also understand the need of regular follow up and I agreed that I will comply with the follow up schedule.

_____ _____ _____

Name of Subject Date Signature of Subject

We have witnessed that the patient signed the above form in the presence of his/her free will after fully having understood its contents.

_____ _____

Name and signature of the person who has explained the details to the patient.

_____ _____ _____

Name of Witness Date Signature of Witness

References :

1. Adapted from National AIDS Control Organization (2021). National Operational Guidelines for ART services, 2021.New Delhi: NACO, Ministry of Health and Family Welfare, Government of India.
2. King KC, Strony R. Needlestick. [Updated 2023 May 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK493147/
3. Post-exposure Prophylaxis after Hepatitis C Occupational Exposure in the Interferon-free Era

11. OUTBREAK INVESTIGATION

An outbreak of infection is defined as:

i. An incident in which two / more people experiencing a similar illness are linked time or place or
ii. The situation where a greater than expected incidence of infection compared to the usual background rate for the particular location or
iii. A single case for certain rare diseases or a significant pathogen (e.g. diphtheria or viral haemorrhagic fever) or
iv. A suspected, anticipated or actual event involving microbial or chemical contamination of food

/ water An outbreak is epidemiologically linked to time, place and person.

CLASSIFICATION OF AN OUTBREAK

	Classification I	
	Confined Limited to some of the members of one family	**Widespread** Involve cases either locally, nationally or internationally
	Classification II	
	Obvious The suspected source can be easily identified. e.g. An episode of food poisoning that affects both HCWs and patients eating from the same source.	**Insidious** They are slow in onset. Source cannot be obviously defined They reach considerable proportions before they become apparent. These outbreaks are detected by laboratory.

Table 18.1Classification of an Outbreak

CASE DEFINITIONS

There are following three categories:

Confirmed Case	**Probable Case**	**Possible/ Suspect Case**
Patients have clinical signs and symptoms of the disease and	Patients have clinical signs and symptoms of the disease or	Patients have clinical signs and symptoms of the disease or
The diagnosis is confirmed by laboratory investigations of relevant specimen.	The patients are epidemiologically linked to a confirmed case (exposed to a confirmed case, eaten the same food etc.)	Patients with fewer typical clinical features

Table 18.2: Outbreak Case definition

PSEUDO-OUTBREAK:

- Real clustering of false cases
- Artefactual clustering of real infections The Reasons for Pseudo-outbreak May be Several:
- Laboratory factors: False reporting due to new technology, new technician, or faulty interpretation.
- Ward-level factors:Incorrect diagnosis, sampling errors (collection, labelling and transportation).
- Environmental factors: Contamination due to environment. E.g., Contaminated tap water used for endoscope cleaning or contaminated tap water used for staining procedure.

OUTBREAK INVESTIGATION AND MANAGEMENT

A suspected outbreak may be identified by a physician or by laboratory personnel, or by ICT while conducting routine surveillance. When an outbreak is detected, the HICC/ ICT/ ICO/ ICN is immediately informed and an urgent meeting of HICC/ ICT is called depending on the size and seriousness of the outbreak.

FORMATION OF AN OUTBREAK CONTROL TEAM (OCT)

An Outbreak Control team (OCT) is immediately formed, relevant to the size and seriousness of the outbreak and the healthcare facility involved. If required the head of the institute and /or state/territory public health unit is also notified.

OCT comprises of:

a. Administrators (Medical and Nursing)
b. Clinicians/ In-charges/ Managers of implicated areas
c. Infection Control Officer
d. Clinical Microbiologists
e. Infectious disease physician
f. Clinical Epidemiologist—
g. Public relation Officer (PRO)
h. Others as defined by circumstances or as per policy of different hospitals

STEPS OF AN OUTBREAK INVESTIGATION

Immediately initiate relevant immediate infection prevention control measures to prevent further transmission and ensure minimum disruption to services.

Step 1:

i. Recognize Outbreak and Prepare to Investigate
ii. Ascertain the reliability of both clinical and laboratory information.
iii. Establish background rate of disease
iv. Consider if observed number of cases is in excess of the usual number
v. Examine HAI surveillance data
vi. Determine if immediate control measures are needed
    a. Reinforce standard precautions
    b. Apply appropriate transmission-based precautions
vii. Notify and communicate
    a. Healthcare workers and ancillary staff in immediate area
    b. Infection control professional
    c. Administration
    d. Microbiology Laboratory
    e. IDSP-Integrated disease surveillance program (if notifiable disease)
    f. Urgent meeting of HICC/ICT and
    g. Formation of an OCT

Step 2:

i. Verify the Diagnosis and Confirm that an Outbreak Exists
ii. Confirm that there are more than expected number of cases meeting the
iii. surveillance case definition of the disease of interest in the period under review:
iv. Confirm clinical diagnoses (symptoms and features of illness)
v. Review laboratory data and request additional laboratory tests, if necessary,

e.g. molecular typing of organisms to confirm clonality

vi. Complete microbiological investigations
vii. Consider likely outbreak definition and whether criteria are met
    a. Are there more cases than expected compared to previous weeks/ months? o Review scientific literature
    b. Consider epidemiology of cases - are there two or more linked cases of the same illness?

Step 3:

Establish Case Definition and Find Cases

i. Establish a set of standard criteria to decide whether or not a person has the disease of concern. Case definition is based on:
ii. Clinical information about the disease
iii. Characteristics of the people who are affected
iv. Information about the location
v. Specification of time period for the outbreak
vi. Case definition can be refined later after collection of primary data
vii. Cases can be classified as Confirmed, Probable or Suspect/possible Find cases: Gather critical information by:
    a. Interview
    b. Follow-up of disease notification
    c. Health alerts
    d. Identify and count cases: Collect the following types of information
    e. identifying information
    f. Demographic information
    g. Clinical information
    h. Risk factor information (including environmental tests)
    i. Prepare line list of cases based on- o Time—date of onset of illness o Person—age, sex
    j. Place—where did the exposure occur? o Other relevant information

Step 4 Characterize outbreak by person, place, and time

a. Review descriptive epidemiology of all cases:
b. Person: sex, age, occupation, residence
c. Place: information that provides indication on possible source of agent and nature of exposure
d. Time: date and time of onset; record relevant events in a timeline
e. Plot an epidemic curve to determine hypothesis and analyze the type of outbreak

Step 5 Determine who is at Risk

i. Identify groups at risk:
ii. Number of people ill
iii. Time and place of onset
iv. Personal characteristics
v. Initiate precautionary measures
    a. Use of standard precautions and appropriate transmission-based precautions
    b. Increase frequency and efficiency of environmental cleaning using appropriate products
    c. prophylactic treatment/immunization
    d. Antibiotic restrictions
    e. Exclusion of cases from high risk activities o Isolation and/or cohorting of patients
    f. Restricting movement of patients, staff and visitors
    g. Screening of patients with isolation of patients and cohorting of contacts;
    h. Provision of health information and advice

Step 6 Develop Hypothesis—the 'how' and 'why'

a. Develop hypotheses from the factual information gathered to date on potential source, vector, pathogen, route of transmission:
    a. Data collected by interview
    b. Common links
    c. Plausible exposures

d. Environmental test results where appropriate
e. Review literature

Step 7 Test Hypothesis with Established Facts Perform epidemiologic study:

a. Retrospective Cohort study—for confined outbreaks
b. Case-control—for widespread outbreaks
c. Analyze the data
d. Compare risk factors among ill (cases) vs. not ill (controls)
e. Attack rates
f. Relative risk

Step 8 Carry out Further Studies if Necessary

i. To support the hypothesis or if analytic studies do not confirm the hypothesis:

Further study to refine case definition

ii. May involve testing of environmental samples, food samples or environmental screening in some situations (e.g. Legionella, Pseudomonas)
iii. HCW screening

Step 9 Implement Ongoing Control / prevention Measures

(This can be done at any time during the outbreak as deemed necessary)

i. Review measures initiated for immediate control (Before Step 1 and Step 5)
ii. Implement appropriate ongoing control measures and strategies to prevent further illness:
    a. Restrict spread from the case
    b. Interrupt chain of infection
    c. Interrupt transmission or reduce exposure o Reduce susceptibility to infection
    d. Assessment of policy, regulations, standards
iii. Monitor-HH Audit, PPE audit, Bundle care audit
iv. Analyze the trend of outbreak after implementing infection control measures to determine their effectiveness.

Step 10. Communicate Findings

i. Communicate and coordinate with all stakeholders (within the hospital):

a. Electronic flagging of medical records of contacts
b. Reinforcement of infection control precautions to staff, patients and visitors
c. Appropriate signages to limit access to the affected clinical unit/room
d. E-mails and multimedia to target all HCWs

ii. Prepare written report that evaluates methods used for the control of the outbreak
a. Include discussion of factors leading to outbreak, comprehensive timelines, summary of investigation and documented actions
b. Short and long -term recommendations for prevention of similar outbreak
c. Disseminate to appropriate stakeholders including publication
d. Guidelines for transparent reporting and intervention studies are available as The ORION Statement and should be referred when preparing report or an article for publication.

iii. Communicate outside the hospital
a. PRO/ a designated person should do it. He/she should have a formal training to do it.
b. This person must be attending all the OCT meetings.
c. The OCT/any other HCW must not communicate directly to media

END OF OUTBREAK

i. OCT meeting at the end of the outbreak:
a. Review the experience of all team members involved in the outbreak management.
b. Identify gaps and particular difficulties that were encountered
c. Revise the outbreak control plan according to the current experience.
d. Recommend, if required, structural or procedural improvements that would reduce the chances of recurrences of such outbreak in future.

ii. Write the outbreak report
a. Preliminary and final confidential outbreak reports
b. The report must summarize full investigations, lessons learnt and recommendations.
c. The report must be sent to the senior management and other appropriate personnel/authorities for action.

iii. Look back investigations

iv. Refer to the process of identifying, tracing, recalling, counselling and testing patients or HCWs who may have been exposed to an infection during an outbreak.

GENERAL OUTBREAK CONTROL MEASURES

i. Staff and patient movement will need to be restricted during an outbreak. If an outbreak has been declared, the rotation of staff or the discharge/ transfer of patients should be discussed with the IPCT/ Health Protection Duty Room.

ii. In outbreak situations it may be necessary to close a ward /unit / care home. This recommendation will be guided by a risk assessment carried out by the Infection Prevention Control Team in The Trust or the Health Protection Duty-room officer in the independent sector. In an acute Trust setting the IPC Team may immediately advise on the closure of a ward. If an outbreak control team is established it will decide on closures to admissions / transfers and staff movement restrictions.

iii. It is essential that communication with patients / residents, the public and staff are clear and that messages are consistent.

iv. Extra cleaning and domestic staff may be required during and immediately
    a. following the outbreak.

v. It may be necessary to order / purchase additional personal protective equipment. If specialist respiratory equipment is required, then access to fit-testing and training will also be necessary.

vi. It may also be necessary to purchase additional supplies of cleaning equipment to facilitate enhanced / terminal cleaning of the environment.

vii. Visiting may need to be restricted and visitors should receive information regarding any risks to them of being exposed to potentially pathogenic micro- organisms.

viii. It may be necessary to record the details of contacts of cases if advised to do so by the Infection Prevention and Control Team (Trust location) / Health Protection Duty-room officer (Independent Sector).

ix. Additional work is created during an outbreak and increased staff numbers will probably be necessary to cope with additional pressures.

ROLE OF OCT

1. Inform all suspect outbreaks to HICC and Microbiology lab.
2. Drawing of a detailed outbreak control plan, clearly addressing the areas of individual responsibilities. And action plans for all involved.
3. Isolate all the suspected cases.
4. Record all information of all the cases comprising of date of admission, clinical diagnosis, time of onset of symptoms, etc.
5. Relevant specimen to be sent to microbiology laboratory
6. Restrict movement of staff and patients
7. Closure of healthcare facility if required
8. Implement and monitor the appropriate infection control measures.
9. In case of a major incident the OCT should seek advice from experts at both regional and national levels.

FLOW CHART OF OUTBREAK INVESTIGATION

Step 1. Recognise outbreak and prepare to investigate

↓

Step 2. Verify the diagnosis and confirm that an outbreak exists

↓

Step 3. Establish case definition and find cases

↓

Step 4. Characterize outbreak by person, place, and time

↓

Step 5. Determine who is at risk

↓

Step 6. Develop hypothesis—the 'how' and 'why'

↓

Step 7. Test hypothesis with established facts

↓

Step 8. Carry out further studies if necessary

↓

Step 9. Implement ongoing control / prevention measures

(This can be done at any time during the outbreak as deemed necessary)

↓

Step 10. Communicate finding

ANNEXURE I

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

URINARY CATHETER INSERTION BUNDLE

PATIENT NAME:	CR. NO.:	AREA:
DATE OF INSERTION:	TIME OF INSERTION:	

SI.no.	INSERTION BUNDLE	YES	NO
1	Assessment of indication for urinary catheter insertion.		
2	Choose appropriate size catheter.		
3	Perform hand hygiene and maintain aseptic technique. Single use gloves.		
4	Perform peri-urethral cleaning with normal saline.		
5	Catheter is inserted by strict aseptic non-touch technique.		
6	Insertion of catheter up to appropriate length and check urine flow before balloon inflation.		
7	Secure the catheter.		

INSERTION PERFORMED BY:
SIGNATURE:

NOTE: Mark ✓ for yes and ✗ for no

ANNEXURE II

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

URINARY CATHETER MAINTENANCE BUNDLE

PATIENT NAME:	CR NO.:	WARD:
DATE OF INSERTION:	DATE OF REMOVAL:	

	DATE	D1:			D2:			D3:			D4:			D5:			D6:			D7:			D8:			D9:			D10:		
S.no	CARE BUNDLE	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N
1	Daily assessment of the need for urinary catheter done																														
2	Daily meatal care by strict aseptic technique (hand hygiene and single use gloves).																														
3	Catheter is secured																														
4	Closed drainage system is maintained.																														
5	Urine flow is unobstructed.																														
6	Urobag is kept below the bladder level but not on the floor.																														
7	No contact between jug and urobag while emptying.																														
	Signature of Nursing Officer																														

NOTE: Mark ✓ for yes and ✗ for no

REMARKS:

ANNEXURE III

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

CENTRAL LINE CATHETER INSERTION BUNDLE

PATIENT NAME:	CR. NO.:	AREA:
DATE OF INSERTION:	TIME OF INSERTION:	

SI.no.	INSERTION BUNDLE	YES	NO
1	Perform hand hygiene before insertion and maintain aseptic technique.		
2	Use maximal sterile barrier precautions (i.e., mask, cap, gown, sterile gloves, and sterile full body drape)		
3	Choose the best insertion site to minimize infections and non-infectious complications based on individual patient characteristics		
4	Prepare the insertion site with >0.5% chlorhexidine with alcohol. The insertion site should be allowed to dry before insertion of CVC.		
5	Secure the catheter.		
6	Apply appropriate sterile dressing.		

INSERTION PERFORMED BY:
SIGNATURE:

NOTE: Mark ✓ for yes and ✗ for no

ANNEXURE IV

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

CENTRAL LINE CATHETER MAINTENANCE BUNDLE

PATIENT NAME: CR NO.: WARD/AREA:

DATE OF INSERTION: DATE OF REMOVAL:

		D1:			D2:			D3:			D4:			D5:			D6:			D7:			D8:			D9:			D10:		
Sl.no	CARE BUNDLES	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N
1	Hand hygiene performed and aseptic technique followed.																														
2	Alcohol hub decontamination before each hub access.																														
3	Any local signs of infection?																														
4	Assessment for dressing change: • if dressing is soiled • change gauge dressing in 2 days • change transparent dressing in 7 days																														
5	Change of dressing with 0.5% chlorhexidine.																														
6	Bathe ICU patients with daily chlorhexidine washes. (Patients of age more than 2 months)																														
7	Daily assessment of readiness of removal of central line.																														
	Dressing change done																														
	Signature of Nursing Officer																														

NOTE: Mark ✓ for yes and ✗ for no

REMARKS:

ANNEXURE V

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

MAINTENANACE CARE BUNDLE (VENTILATOR)

PATIENT NAME:	CR NO.:	AREA:
DATE OF INTUBATION:	DATE OF EXTUBATION:	

	DATE	D1:			D2:			D3:			D4:			D5:			D6:			D7:			D8:			D9:			D10:		
S.no	CARE BUNDLE	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N
1	Head end elevation of 30°- 45°																														
2	Adherence to hand hygiene.																														
3	Daily oral care.																														
4	Aseptic technique while Suctioning.																														
5	DVT prophylaxis.																														
6	Need of PUD prophylaxis assessed.																														
7	Daily assessment of readiness for removal.																														
	Signature of Nursing Officer																														

NOTE: Mark ✓ for yes and ✗ for no

REMARKS:

ANNEXURE VI

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

SSI CARE BUNDLE

PATIENT NAME: CR NO: AREA:
AGE/SEX:

DATE:

Surgical Procedure:

S.no.	SSI bundle	YES	NO	Remarks
Preoperative				
1	Preoperative bathing			
2	Screening for S. aureus (for special cases)			
3	Hair removal not done or done by clipper			
4	Surgical antibiotic prophylaxis			
Signature:				
Intraoperative				
5	surgical site skin preparation (antiseptics +alcohol)			
6	Hand scrub before and in-between cases			
7	Oxygenation of fio_2 (80%)			
8	Normothermia (36°C)			
9	Blood glucose (140-200mg/dl)			
10	Normovolemia			
Signature:				
Postoperative				
11	Aseptic Non-Touch Technique			
12	Surgical dressing			
13	Hand hygiene			
Signature:				

ANNEXURE VII

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI
HEALTHCARE-ASSOCIATED INFECTION SURVEILLANCE FORM (ADULTS)

Patient Name:	**CR NO.**	**Age:**	**Sex:**	**ICU/Ward:**
Department	**Admitting Unit:**	**Dt.of Adm.**		**Dt. Of Adm. to ICU:**
Provisional Diagnosis:		**Final Diagnosis:**		
Outcome:	**Transfer out to ward/unit name& date:**	**LAMA on:**	**Discharge on:**	**Expired on:**

Risk Factors/co-morbidities (Circle features present at admission)

DM	**HTN**	**CLD**	**CKD**	**HIV**	**TB**	**Transplantation**	**Immunosuppressant**	**Any other**

Type of surgery: **Date of Surgery:**

Type of device used and Devices Days

Intervention	**Date of Insertion**	**Date of Removal**	**Re-insertion**	**Removal**
Urinary catheter				
Mechanical Ventilation/ET tube				
Tracheostomy				
CVC=Jugular/Subclavian/Femoral/PICC				
Surgical Site Drainage tube				
Dialysis Sheath				

Daily Monitoring

		D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9	D-10	D-11	D-12	D-13	D-14	D-15
HAI	**Date**															
All	Temperature															
CA UTI	Catheter Present															
	Suprapubic tenderness															
	Loin pain															
CLA BSI	*1. Urgency, 2. Frequency, 3. Dysuria CL (Central line) present															
	Chill															
	Hypotension (SBP <90)															
VAE	MV (mechanical ventilator) present															
	$PEEP_{dm}$															
	$FiO2_{dm}$															
	WBC count															
	New antibiotics															
SSI	Purulent discharge at site															
	Clinician's diagnosis															
	Tenderness, swelling, erythema, heat															
	**Abcess at site															

- To be reported only when urinary catheter is not in place.
- Detected by physical exam/histopathological exam/ imaging

HAI surveillance Form-Adult patient (page 2)

Microbiology Culture Report (Site specific culture and blood culture: to be filled even when culture is negative)				
Date of sample collection	Sample	Organisms isolated	Colony count	AST report
				S-
				R-
				I-
				S-
				R-
				I-
				S-
				R-
				I-
				S-
				R-
				I-
				S-
				R-
				I-

S-Sensitive, R-Resistant,I-Intermediate

A-Ampicilin, Ak-Amikacin G-Gentamicin, Tb-Tobramycin, AMC-Amoxyclav, CTX-Cefotaxime, Ci-Ceftriaxone, C-Ceftazidine, Cx-Cefoxitin, Clox-Cloxacillin, M-Meropenem, PTT- Piperacillin-Tazobactum E-Erythromycin, Cf-ciprofloxacin, N- Nitrofurantoin, P-Penicillin, T-Tetracyclin, I-Imipenem, Cot-Cotrimazole, CL-Colisin, Nx-Norfloxacin, Van-vancomycin

ANNEXURE -VIII

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI
HEALTHCARE-ASSOCIATED INFECTION SURVEILLANCE FORM (PEDIATRIC)

Patient Name:	**CR NO.**	**Age:**	**Sex:**	**ICU/Ward:**
Department	**Admitting Unit:**	**Dt.of Adm.**		**Dt. Of Adm. to ICU:**
Provisional Diagnosis:		**Final Diagnosis:**		
Outcome:	**Transfer out to ward/unit name& date:**	**LAMA on:**	**Discharge on:**	**Expired on:**

Risk factors/co-morbidities (Circle features present at admission)

DM	**HTN**	**CLD**	**HIV**	**TB**	**Transplantation**	**Immunosuppressant**	**Any others**

Type of surgery: **Date of Surgery:**

Type of device used and Devices Days

Intervention	**Date of Insertion**	**Date of Removal**	**Re-insertion**	**Removal**
Urinary catheter				
Mechanical Ventilation/ET tube				
Tracheostomy				
CVC=Jugular/Subclavian/Femoral/PICC				
Surgical Site Drainage tube				
Dialysis Sheath				

Daily Monitoring

		D-1	D-2	D-3	D-4	D-5	D-6	D-7	D-8	D-9	D-10	D-11	D-12	D-13	D-14	D-15
HAI	**Date**															
All	Temperature (>100.4 or <96.8)															
CA- UTI	Catheter															
	Suprapubic tenderness															
	Vomiting															
	Lethargy															
	Apnea															
CA-UTI CLABSI, VAP	Bradycardia,															
	CL (Central line)															
	Hypotension															
	MV (mechanical ventilator) present															
	Worsening gas exchange															

VAP	Purulent sputum (new/Change) ↑ secretion ↓Suctioning																
	Sounds: Wheeze/rales or rhonchi																
	1) Cough 2) Tachypnea, 3) dyspnea																
	Nasal Flare with grunting																
	WBC Count																
	Chest X-ray (any one)*																
SSI	Purulent discharge at site																
	Clinician's diagnosis																
	Tenderness, swelling, erythema, heat																
	**Abcess at site																

- Chest X-ray i) infiltrate, ii) consolidation iii) cavitation iv) pneumatocele (< 1 year)
- ** Detected by physic

Microbiology Culture Report (Site specific culture and blood culture: to be filled even when culture is negative)				
Date of sample collection	Sample	Organisms isolated	Colony count	AST report
				S-
				R-
				I-
				S-
				R-
				I-
				S-
				R-
				I-
				S-
				R-
				I-
				S-
				R-
				I-

S-Sensitive, R-Resistant,I-Intermediate

A-Ampicilin, Ak-Amikacin G-Gentamicin, Tb-Tobramycin, AMC-Amoxyclav, CTX-Cefotaxime, Ci-Ceftriaxone, C-Ceftazidine, Cx-Cefoxitin, Clox-Cloxacillin, M-Meropenem, PTT- Piperacillin-Tazobactum E-Erythromycin, Cf-ciprofloxacin, N- Nitrofurantoin, P-Penicillin, T-Tetracyclin, I-Imipenem, Cot-Cotrimazole, CL-Colisin, Nx-Norfloxacin, Van-vancomycin

ANNEXURE IX

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI
SSI SURVEILLANCE FROM

Patient's Name:	Age/Sex	Contact no:	
CR No.:	DOA:	DOS:	DOE:
Ward/Department:		Operating Surgeon:	

Surgical Site infection

Components		YES	No
1. Patient's had surgery within the past 30 days or Surgery within 90 days if implants in place or breast, cardiac surgery, or herniorrhaphy			
2. Wound class (Mark which applies) Clean	Clean contaminated	contaminated	Dirty
3.PATOS(Present at the time of Surgery)-visible pus/abscess at operation site; Documented in OT note		Yes	No

Surgical Site Infection? ☐ Yes ☐ No

Patient re-admitted for surgical site infection? ☐ Yes ☐ No (Note reason)_____

Date of re-admission for surgical site infection: __/__/__ : Discharge date: __/__/__

○ **Superficial SSI** (skin/subcutaneous) e.g., cellulitis ○ Purulent drainage (pus) from superficial incision **OR** ○ Organism identified (if culture done)* **OR** ○ Superficial incision deliberately re-opened **AND** ○ Infection symptoms **OR** ○ Surgeon/attending physician diagnosis	○ **Deep SSI** (fascia/muscle) e.g., deep abscess ○ Purulent drainage (pus) from deep incision **OR** ○ Deep incision dehiscence or deliberately opened by surgeon **AND** ○ Organism identified (if culture done)* **AND** ○ Infection symptoms **OR** ○ Deep infection/abscess found on imaging/examination	○ **Organ/space SSI** (deeper than fascia/muscle) e.g., endometritis (organ), peritonitis (space) ○ Purulent drainage (pus) from sterile organ or space (from an inserted drain) **OR** ○ Organ or space infection/abscess found on imaging/examination **OR** ○ Organism identified from fluid/tissue from organ/space ***Meets at least one criterion for a specific organ/space infection site listed in NHSN**

Other Surgical Complications:
Non-infectious local wound complications including bleeding and abnormal skin reactions
Patient death: Date:____/___/___ Cause of death(as far as known)_____

Microbiology culture results	Specimen taken Date:__/__/___ Type:	Organism(s) identified	Antibiotic resistance/ sensitivities

*Note: Most surgical wounds that have broken down rapidly become colonized with bacteria. Bacterial growth from a wound is only significant when a sample to identify organisms by microbiological culture is collected aseptically under sterile conditions with symptoms of infection also present.

Name &Sign of ICN Name &Sign of ICO Name &Sign of Member Secretary

List of specific organ/space infection site

Code	Site	Code	Site
BONE	Osteomyelitis	LUNG:	Other infections of the lower respiratory tract
BRST	Breast abscess or mastitis	MED	Mediastinitis
CARD	Myocarditis or pericarditis	MEN	Meningitis or ventriculitis
DISC	Disc space	ORAL	Oral cavity (mouth, tongue, or gums)
EAR	Ear, mastoid	OREP	Other infections of the male or female reproductive tract
EMET	Endometritis	PJI	Periprosthetic joint infection
ENDO	Endocarditis	SA	Spinal abscess without meningitis
GIT	Gastrointestinal tract	SINU	Sinusitis
IAB	Intraabdominal, not specified	UR	Upper respiratory tract
IC	Intracranial, brain abscess or dura	USI	Urinary system infection
JNT	Joint or Bursa	VASC	Arterial or venous infection
VCUF	Vaginal cuff		

ANNEXURE X

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI
HOSPITAL INFECTION CONTROL COMMITTEE (HICC)
Surveillance of Surgical Site Infection (After discharge)

Patient's name:	**Age/Sex:**
CR NO:	
Department/OPD:	**Date of OPD visit:**
Name of consultant:	**clinical Diagnosis:**
History of Surgical procedure undergone:	
Name of surgery undergone: **1.** **2.** **3.**	**Date of surgery:**
Type of surgery: ☐ **Clean** ☐ **Clean- Contaminated** ☐ **contaminated** ☐ **dirty or Infected**	
Name of the operating department And Unit:	**Ward in which admitted postoperatively:**
Date of admission:	**Postoperative duration in ward:**
Date of discharge/ LAMA:	**Outcome at discharge:**

Presenting complain at follow up visit:

Presence of purulent discharge at operative site: ☐
Pain, tenderness, Swelling, Erythema, Heat at operative site: ☐
Abscess at site(Detected by Physical exam/histopathological exam/imaging): ☐
Fever: ☐
Spontaneous dehiscence of the wound: ☐
Deliberate reopening of the incision by the surgeon: ☐
Clinician's diagnosis for SSI: ☐

Type of surgical site infection(diagnoised by surgeon)

☐ Superficial incisional SSI ☐ Deep incisional SSI ☐ Organ/ space SSI

Microbiology culture report if available

Specimen	**Date of collection**	**Organism/s grown**	**Antibiotic sensitivity reporty**		
			sensitive	**Resistant**	**Intermediate**

Data to be collected upto 30 days after surgery in case of suspected superficial SSI and in acse of 90 days in case of suspected deep or organ/ space SSI

Name & Sign of ICN **Name & sign of ICO**

Table 2. Surveillance Periods for SSI Following Selected NHSN Operative Procedure Categories.

Day 1 = the date of the procedure

30-day Surveillance			
Category	**Operative Procedure**	**Category**	**Operative Procedure**
AAA	Abdominal aortic aneurysm repair	LAM	Laminectomy
AMP	Limb amputation	LTP	Liver transplant
APPY	Appendix surgery	NECK	Neck surgery
AVSD	Shunt for dialysis	NEPH	Kidney surgery
BILI	Bile duct, liver or pancreatic surgery	OVRY	Ovarian surgery
CEA	Carotid endarterectomy	PROS	Prostate surgery
CHOL	Gallbladder surgery	REC	Rectal surgery
COLO	Colon surgery	SB	Small bowel surgery
CSEC	Cesarean section	SPLE	Spleen surgery
GAST	Gastric surgery	THOR	Thoracic surgery
HTP	Heart transplant	THYR	Thyroid and/or parathyroid surgery
HYST	Abdominal hysterectomy	VHYS	Vaginal hysterectomy
KTP	Kidney transplant	XLAP	Exploratory laparotomy
90-day Surveillance			
BRST	Breast surgery	HPRO	Hip prosthesis
CARD	Cardiac surgery	KPRO	Knee prosthesis
CBGB	Coronary artery bypass graft with both chest and donor site incisions	PACE	Pacemaker surgery
CBGC	Coronary artery bypass graft with chest incision only	PVBY	Peripheral vascular bypass surgery
CRAN	Craniotomy	VSHN	Ventricular shunt
FUSN	Spinal fusion	HPRO	Hip prosthesis
HER	Herniorrhaphy	KPRO	Knee prosthesis
PACE	Pacemaker surgery	PVBY	Peripheral vascular bypass surgery
VSHN	Ventricular shunt		

Notes:

- Superficial incisional SSIs are monitored for a 30-day period for all procedure types.
- Secondary incisional SSIs are monitored for a 30-day period regardless of the surveillance period for the primary site.

ANNEXURE XI

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

HOSPITAL INFECTION CONTROL COMMITTEE

CLEANING CHECKLIST FOR HIGH TOUCH SURFACES

Location	**Dates**							
Sr. No	**Name of the object**	**M**	**T**	**W**	**T**	**F**	**S**	**S**
1	Patients cot and side rails							
2	Bed side locker							
3	Dressing trolley							
4	IV stand							
5	Cardiac table							
6	Crash cart							
7	Oxygen cylinders							
8	cupboards							
9	Fridge handle							
10	Door handle							
11	Window slabs							
12	Suction canisters and oxygen flow meters							
13	Ventilators							
14	Monitors and cable							
15	Defibrillator							
16	Infusion pump/ Syringe pump							
18	ECG machine							
19	Nurses work station							
20	Desktop and accessories							
Sign of Housekeeping supervisor								
Sign of Nursing officer In charge								

Note:

Kindly refer to the HICC manual for the frequency of cleaning as it varies with Low/Moderate/high risk areas

The detailed frequency of daily cleaning process in each areas should be documented separately as per the guidelines.

ANNEXURE XII

ALL INDIA INSTITUTE OF MEDICAL SCIENCES, GUWAHATI

HOSPITAL INFECTION CONTROL COMMITTEE

CLEANING CHECKLIST FOR ICU/HDU/WARD/ER

Area:	Dates																					
		Mon			Tue			wed			Thurs			Fri			Sat			Sun		
		M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N	M	E	N
Sr No.	Name of Site																					
1	Removal of garbage																					
2	Dump dusting																					
3	Mopping with disinfectant																					
4	Mopping of corridors																					
5	Doors																					
6	Windows																					
7	Wall and ceiling																					
8	Washroom																					
Signature of Housekeeping Supervisor																						
Signature of Nursing Officer In charge																						

Note:

Kindly refer to the HICC manual for the frequency of cleaning as it varies with Low/Moderate/high risk areas

The detailed frequency of daily cleaning in each areas should be documented separately as per the guidelines.

ANNEXURE XIII

ALL INDIA INSTITUTE OF MEDICALS SCIENCES, GUWAHATI

HOSPITAL INFECTION CONTROL COMMITTEE

CLEANING CHECKLIST FOR OT

NAME OF THE UNIT:																							
Sr.no.	DATE																						
	CLEANING SITE	MON			TUE			WED			THU			FRI			SAT			SUN			
		I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
1	OT table																						
2	OT lights																						
3	Anesthesia trolley																						
4	Instrument trolley																						
5	Crash cart																						
6	Suction apparatus																						
7	IV stand																						
8	Cautery machine																						
9	Cupboards																						
10	Monitors																						
11	Mayo's trolley																						
12	Airway trolley																						
13	Floor																						
14	Bins emptied and new bags placed																						
Signature of the Nursing Officer																							
Signature of the housekeeping supervisor																							

Note: [I= Before case begin; II-In between cases; III= terminal cleaning (Tick which is applicable)

Note:

The detailed cleaning in between each OT has to be documented daily separately

ANNEXURE XIV

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OPD DAILY CLEANING CHECKLIST

LOCATION:																													**MONTH:**	
SL NO	**NAME OF THE OBJECT**	**DATES**																												
																													SIGNATURE OF HOUSEKEEPING STAFF	SIGNATURE OF NURSING STAFF
1	CORRIDOR																													
2	REGISTRATION AREA																													
3	CONSULTING ROOM																													
4	TROLLEY/CRASH CART																													
5	EXAMINATION TABLE																													
6	CONSULTING TABLE																													
7	CHAIRS/STOOLS																													
8	DESKTOP AND ACCESSORIES																													
9	CUPBOARDS/RACKS																													
7	OTHER EQUIPMENTS IF ANY																													
REMARKS:																														

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