NATIONAL AYUSH MISSION KERALA

Kerala AYUSH Kayakalp

Transforming AYUSH healthcare

Implementation Guidelines

NATIONAL AYUSH MISSION KERALA

Government of Kerala

NATIONAL AYUSH MISSION KERALA

KERALA AYUSH KAYAKALP

TRANSFORMING AYUSH HEALTHCARE FACILITIES

Kerala AYUSH Kayakalp

Transforming AYUSH healthcare

Implementation Guidelines

Version : 01 | APRIL 2025

Editorial Board

Dr. RAJAN N. KHOBRAGADE IAS
ADDITIONAL CHIEF SECRETARY

Health & Family Welfare &
Ayush Departments
Government of Kerala
Thiruvananthapuram-695 001

Phone { Office : 0471-2327865
0471-2518255

E-mail : secy.hlth@kerala.gov.in

Date 27th May 2025

MESSAGE

The health sector in India has witnessed transformative reforms focused on quality, hygiene, and accountability. A key element of this transformation has been the **Kayakalp initiative**, launched by the Government of India to recognize and incentivize public health facilities for ensuring cleanliness, sanitation, and infection control.

Expanding this initiative to **AYUSH healthcare institutions** is a significant and strategic move that underscores the importance of integrating traditional systems of medicine within the national quality framework. Our state welcomes this extension and is committed to its effective implementation.

The **AYUSH Kayakalp Implementation Guidelines** serve as a policy blueprint, reinforcing our state's vision to build equitable, clean, and safe healthcare facilities. These guidelines are not just about compliance—they reflect a larger goal: fostering public confidence in AYUSH systems by upholding standards of hygiene, transparency, and service quality.

I am confident that this initiative will not only enhance the physical environment of our AYUSH institutions but will also catalyze systemic improvements in healthcare governance and delivery. I commend the efforts of all institutions and personnel involved and urge them to view Kayakalp as a continuous journey of institutional excellence.

Rajan

Rajan Khobragade

MESSAGE

Our state is committed to promoting cleanliness in public spaces, with a specific emphasis on improving hygiene standards in AYUSH healthcare facilities. Recognizing the pivotal role of public health institutions in safeguarding the health of a significant portion of the population, ensuring cleanliness and adherence to infection control protocols within these facilities is imperative. The objectives of the Kayakalp scheme are to promote cleanliness, hygiene, and infection control practices in AYUSH public healthcare facilities by incentivizing and recognizing those facilities that demonstrate exemplary performance in adhering to standard protocols. This handbook has been meticulously prepared to serve as a practical and comprehensive resource for AYUSH healthcare facilities participating in the Kayakalp Award and aspiring to elevate the quality of healthcare services.

We extend our best wishes to all for a better understanding and implementation of the AYUSH system.

Dr. D. Sajith Babu IAS
State Mission Director
National AYUSH Mission

MESSAGE

Dear Esteemed Colleagues and Practitioners,

It is with great pleasure that I extend my heartfelt appreciation for your commitment to the enhancement of healthcare standards in the field of AYUSH. As the Director of Indian Systems of Medicine, I acknowledge the importance of the Implementation Handbook for AYUSH Kayakalp award programme, representing a significant milestone in our collective effort to ensure quality healthcare delivery. This hand book, developed under the auspices of the National AYUSH Mission, reflects our unwavering dedication to upholding the highest standards in AYUSH sector. It serves as a comprehensive guide to facilitate the seamless integration of Kayakalp implementations into our AYUSH practices, nurturing excellence in hygiene and sanitation practices our healthcare facilities. I commend the collaborative efforts in making this initiative a reality, and I am confident that this handbook will serve as a beacon guiding our practitioners to achieve and maintain the coveted AYUSH Kayakalp award programme. Together, let us continue to elevate the stature of traditional Indian systems of medicine and contribute to the well-being of our communities.

Warm regards,

Dr. Preeya K.S
Director
Dept. of Indian Systems of Medicine

MESSAGE

The Kerala AYUSH Kayakalp Award Programme recognizes Homoeopathic institutions that demonstrate exemplary performance in adhering to standard protocols of cleanliness and infection control. This prestigious acknowledgment highlights their commitment to delivering high-quality, hygienic, and patient-centric healthcare services within the AYUSH sector. By maintaining excellence in hygiene and infection control practices, these institutions set a benchmark for others, positioning themselves as leaders in providing holistic and patient-centered care. Aligned with the principles of Kayakalp Guidelines, this initiative fosters a culture of continuous quality improvement, encouraging Homoeopathic institutions to consistently review and enhance their practices to ensure the highest standards of patient safety, satisfaction, and overall well-being.

Wishing all participants continued success and excellence in their journey toward quality healthcare delivery.

Dr. M. P. Beena
Director
Dept. of Homoeopathy

CONTENTS

Introduction

After the launch of ‘’Swachh Bharat Abhiyan (SBA)’’ on 2nd October 2014, ‘’Kayakalp’’ initiative was launched by the Ministry of Health & Family Welfare on 15thMay 2015 to complement these efforts. The objectives of the‘’Kayakalp’’ Scheme are to promote cleanliness, hygiene and infection control practices in public healthcare facilities, through incentivizing and recognizing such public healthcare facilities that show exemplary performance in adhering to standard protocols of cleanliness and infection control; to inculcate a culture of ongoing assessment and peer review of performance related to hygiene, cleanliness and sanitation; to create and share sustainable practices related to improved cleanliness in public health facilities linked to positive health outcomes.

Background

Our state is committed to promoting cleanliness in public spaces, with a specific emphasis on improving hygiene standards in AYUSH healthcare facilities. Recognizing the pivotal role of public health institutions in safeguarding the health of a significant portion of the population, ensuring cleanliness and adherence to infection control protocols within these facilities is imperative. Central to this endeavor is the "Kayakalp" program, designed to commend institutions for their dedication to maintaining a hygienic healthcare environment. In alignment with these objectives, guidelines focusing on hygiene in healthcare institutions have been disseminated.

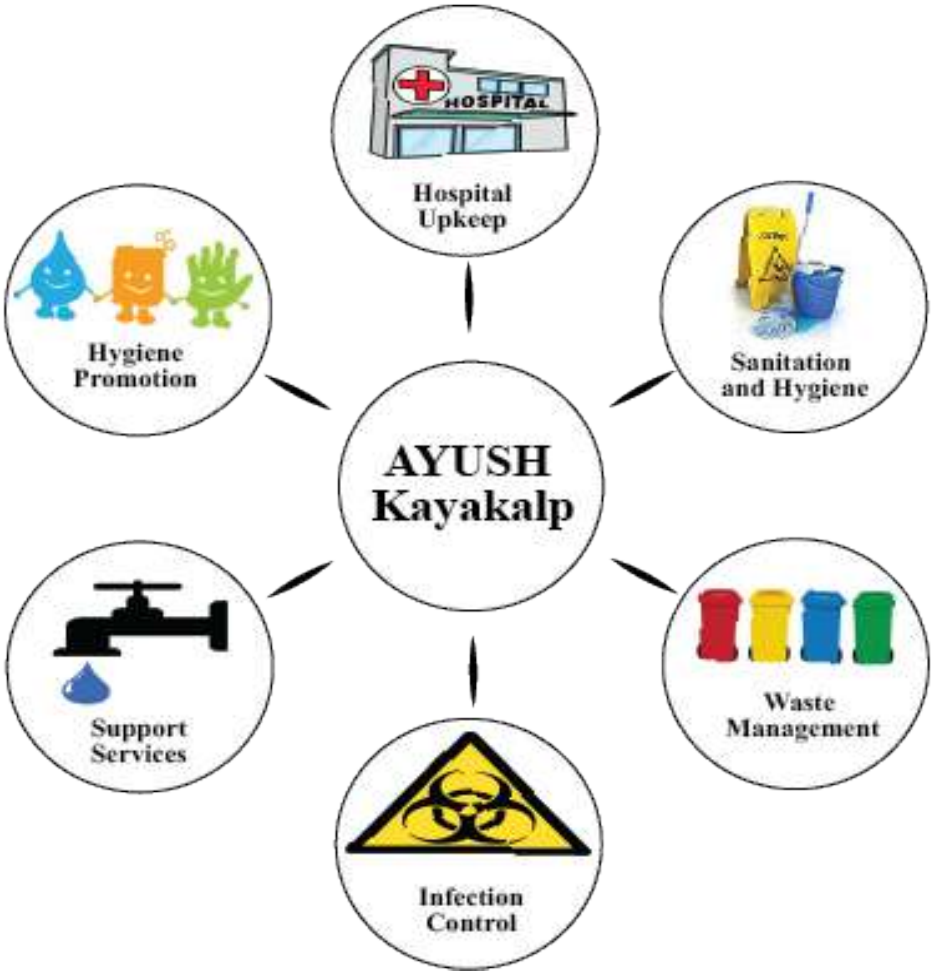
Objectives

1. Promote cleanliness, hygiene, and infection control practices in AYUSH healthcare facilities.
2. Incentivize and formally recognize AYUSH healthcare facilities that demonstrate exemplary performance in adhering to standard protocols of cleanliness and infection control.
3. Foster a culture of continuous assessment and peer review of performance related to hygiene, cleanliness, and sanitation within AYUSH healthcare facilities.
4. Develop and disseminate sustainable practices aimed at improving cleanliness in AYUSH health facilities, with a focus on positive health outcomes.

“AYUSH Kayakalp- Guidelines for implementation” have been developed as an implementation tool and enabler document to find solutions to the identified problems, these guidelines are meant for the implementation of AYUSH Kayakalp programme in the AYUSH healthcare facilities. These guidelines have been developed after a detailed literature review of the existing best practices in the field of AYUSH hospital sanitation, housekeeping, infection control, general maintenance, waste management, and support services etc.; and relevant extracts from the same were adapted with suitable changes as per the needs of public health systems. These guidelines are generic in nature and can be adopted by the healthcare facilities judiciously as per their scope of services. While framing these guidelines actual logistics, staff and other constraints in the public healthcare facilities have also been kept under consideration. This handbook would serve as a practical guide to follow standard protocols and practices to achieve highest level of standards related to cleanliness, hygiene and infection control at AYUSH public healthcare facilities.

These guidelines are divided into six thematic areas as per the“AYUSH Kayakalp”Scheme

A. Hospital Upkeep
B. Sanitation and Hygiene
C. Waste Management
D. Infection Control
E. Support Services
F. Hygiene Promotion



A. Hospital /Facility Upkeep

The key components of healthcare facility upkeep are categorized under the following criteria:

- Pest and Animal Control
- Landscaping & Gardening
- Maintenance of Open Areas
- Healthcare Facility/Facility Appearance
- Infrastructure Maintenance
- Illumination and Lighting
- Maintenance of Furniture and Fixtures
- Removal of Junk Material
- Water Conservation
- Workplace Management

Pest and Animal Control

To ensure a pest and animal-free environment, health facilities can undertake various activities, which in general may include proper infrastructure maintenance, provisions of physical barriers, having a pest control plan, and engaging a pest control agency. Health facilities should ensure that the following requirements are met for pest and animal control.

Minimum Requirements for Pest and Animal Control

The following measures should be taken by the healthcare facility:

- Healthcare facilities should engage a pest control agency for carrying out pest control activities, including anti-termite treatment for wooden furniture and fixtures. The records of engaging such an agency and pest control activities need to be maintained.
- The healthcare facility's boundary wall should be at least 2.5 meters high, and cattle traps should be installed at all entrances and exits to prevent the entry of stray animals.
- Windows and doors of the facility should be designed to minimize or prevent the entry of flying pests.
- Healthcare facility staff must adhere to best practices for housekeeping, cleaning, and disinfection protocols.
- Healthcare facility staff should also implement best practices for waste management.
- A periodic maintenance plan needs to be complied with for the maintenance of cracks and holes in infrastructure and for any plumbing faults in utilities and pipes, fixing of clogs, and fastening of floor drains.
- Regular trimming of landscapes, plants, shrubs, and trees to prevent rodents from having easy access to upper levels, windows, and the roof.
- Regular cleaning of drains and checking for any drain clogs.
- Good storage practices for materials, especially food item storage in kitchens and cafeterias.
- Coordination with local authorities to prevent the accumulation of waste around the premises of the healthcare facility, as it leads to pest infestation in and around the premises.

Cattle trap installed at the entrance of the hospital

Pest control measures

Pest control plan :

Healthcare facilities must have an effective pest control plan to ensure a pest- and animal-free environment. The key aspects of this plan include:

- Engaging a pest control agency for carrying out pest control activities in the facility.
- Pest control activities should also include anti-termite treatment for furniture and fixtures.
- The pest control plan includes the frequency of carrying out pest control activities.
- Besides the normal frequency of these activities, such a plan should also include indications for conducting pest control, such as upon the incidence of pest presence (e.g., pest sightings, droppings, or pest catches in monitoring traps) and when non-chemical approaches such as vacuuming, trapping, and exclusion (i.e., physically blocking pests' entrance) have been unsuccessful or are inappropriate.
- The pest control plan should also include routine inspection and monitoring for pest presence.
- The plan should include storage conditions and methods for different materials, especially food items.

Measures for a Mosquito-Free Environment

The healthcare facility should take extra measures to ensure a mosquito-free environment. The health facility should ensure that the environment is clean and that all water tanks and containers are covered. In addition to these basic measures, the following additional steps need to be taken by the healthcare facility to provide a mosquito-free environment and ensure patient safety:

- Eliminate standing water in and around the healthcare facility.
- All the containers like coolers, buckets, planters, flower pots, trash containers should be checked for water storage and should be cleaned on weekly basis
- Healthcare facilities can use good quality insect repellents
- Tightly cover water storage containers (buckets, cisterns, rain barrels)
- For containers without lids, use fine wire mesh
- All the septic tanks should be checked for cracks or gaps and open vent should be covered with fine wire mesh
- Healthcare facilities may use mesh/net on windows and doors
- Health facilities may also use mosquito nets for patient safety.

Mosquito net used in hospital

Landscaping and Gardening

Landscaping serves to improve the visual appeal of open areas within the healthcare facility. Well-planned and maintained landscapes and gardens offer various benefits for both healthcare facility staff and patients:

- **Physical Benefits:** Interacting with natural surroundings positively impacts patients' sense of well-being, contributing to their physical health.
- **Psychological Benefits:** Natural scenery helps divert patients' attention from illness, maintaining stable heart rates and blood pressure levels.
- **Social Benefits:** The presence of natural environments facilitates social integration, providing spaces for interaction and support among patients, families, and staff.

When designing healthcare facility landscapes and gardens, the following criteria should be considered:

- While planning the garden, location, accessibility, environment, and integration with overall facility design should be taken into account.

- Gardens should be attractively designed and easily accessible through entrances and paths.
- The garden design should consider patients' psychological and physical needs, disabilities, and duration of stay.
- Patients undergoing different treatments may use these areas for different purposes. For example, vulnerable patients may need walking aids in the gardens; senior citizens may need handrails and more shaded areas; wheelchair-bound patients may require proper paths for access.
- All green areas of the hospital should be provided with barricades, fences, wire mesh, and gates to prevent unauthorized entry and to restrict mishandling of the plants.
- The hospital front area should be maintained with grass beds, trees, and aesthetically pleasing gardens.
- All dry leaves and green waste should be removed daily.

Landscaping in hospital

Herbal Garden

A dedicated herbal garden should be established within the healthcare facility premises, featuring medicinal plants relevant to the AYUSH system. The herbal garden should:

- Be designed to educate patients and visitors about the benefits of herbal medicine.
- The herbal garden can be set up in addition to the normal garden or in separate plots. Pots can also be used in addition.
- Contain properly labeled medicinal plants with descriptions of their uses.
- Be maintained regularly to ensure plant health and cleanliness.
- Be incorporated as part of the healthcare facility's overall landscaping plan.
- Consist of medicinal plants indigenous to the region. Organic and compost fertilizers should be used exclusively for planting medicinal herbs, avoiding chemical fertilizers.
- Follow all criteria outlined for landscaping and gardening in the planning and maintenance of herbal gardens.

Herbal garden

Maintenance of Open Areas

Well-maintained open spaces within the healthcare facility enhance the aesthetic appeal of the facility and play a crucial role in the physical, psychological, and social well-being of patients during their recovery. To ensure the upkeep of open areas, the following minimum interventions should be observed:

- **No Abandoned Buildings:** Healthcare facility premises should not have abandoned buildings as they pose safety risks and may attract pests or unsocial activities. Any dilapidated building that cannot be repaired should be demolished or, if relocation of services is not feasible, properly marked as "ABANDONED" and secured.
- **No Encroachments:** Unauthorized encroachments by vendors or shops within the healthcare facility premises should be strictly prohibited. Healthcare facility authorities must ensure that access roads to the healthcare facility are not obstructed by vendors or unauthorized shops.
- **No Thoroughfare:** Boundary walls of the healthcare facility should remain intact to prevent public thoroughfare. Entry and exit points of the facility should be guarded to restrict access by the general public.
- **No Water Logging:** Proper sloping of open areas should facilitate easy drainage of runoff water. The drainage system should be regularly checked to ensure unhindered flow, and maintenance should be carried out as per the healthcare facility's periodic maintenance program. Potholes and bumps in open areas and access roads should be repaired periodically.
- **Vegetation Control:** Healthcare facility premises should be free of overgrown shrubs, weeds, grass, and wild vegetation. Regular trimming of overgrown branches of plants and trees should be conducted as needed.

Healthcare /Facility Appearance

The appearance of a healthcare facility, if properly designed, can have positive effects on patients, visitors, and staff. It can contribute to reducing stress and fatigue among patients and staff, thereby enhancing the effectiveness of care delivery and overall healthcare quality. Key considerations for planning the appearance of the facility include:

- Selecting soothing colors for exterior and interior paint; branding should be done for AHWCs as per guidelines.
- Prominently displaying the facility's name and services, preferably in a bilingual language.
- Implementing an effective signage system.
- Providing Information, Education, and Communication (IEC) materials.

Paint and Plaster

The hospital should be plastered evenly for smoother surfaces and should be painted both from outside and inside in a uniform color scheme that reflects a stress-free and calm environment.

- The facility should regularly check for any chipping of plaster and fading of paints.
- Regular maintenance of plaster and paint needs to be a part of the periodic maintenance program.
- The color schemes can be adopted as per state directives or as planned by the hospital management. In the case of AHWCs, branding should be done as per the guidelines.
- While planning the material for plaster and paint, the infection control effectiveness of the materials should be considered.

Signage System

Due to the multi-departmental nature of healthcare facilities and the diverse services offered, an effective signage system is crucial. The system not only aids in navigation within the facility but also provides pertinent information about the services available. When planning the signage system, the following elements should be taken into account:

- Signposts should have a uniform color scheme and offer clear visual signals.
- Signs should be prominently displayed and easily understood.
- Content should be clear, consistent, and bilingual (English and the local language).
- Font size should be legible from a distance, and the type style should be compatible with pictographs and the environment.
- Signboard shapes should be customized to the location and avoid complexity.
- Signages should be placed at eye level for optimal visibility.
- The signage system should facilitate the flow and structure of the health facility's activities.

- Content should be concise and unambiguous, conveying messages clearly and proactively.
- Instructional boards in hospitals should be proactive, like “Help us in maintaining silence,” instead of being passive, like “Keep silence.”

Types of signages

Healthcare facilities must display various types of signages as required by national or state laws and to aid navigation within the facility:

Regulatory Signages:

These signages include mandatory displays under different rules and regulations as per national or state laws. These include, but are not limited to, the following:

- Signage under PCPNDT Act
- No Smoking signage
- Signage as per Atomic Energy Regulatory Board (AERB) guidelines for radiation warning
- Signage under Bio-Medical Waste (BMW) Rules 2016 with a biohazard symbol
- Signage for CCTV surveillance
- Illuminated signage for fire exits and fire exit plans on each floor
- Display of licenses and certifications for various services like pharmacy, registration of sonologist and USG machine, blood bank license, AERB license, etc.
- Others as applicable to the facility.

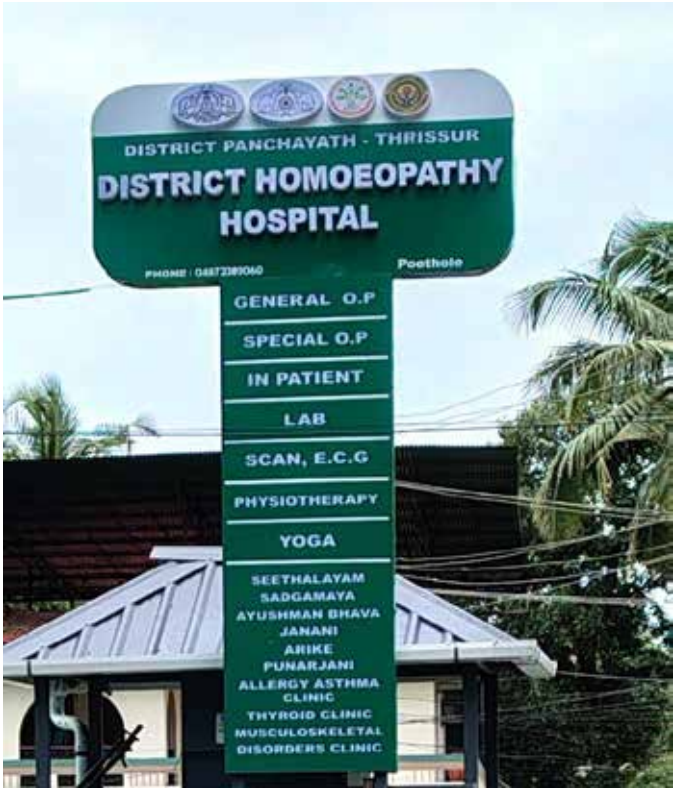
Regulatory signage displayed in hospitals

Locational or Departmental Signages:

These signs identify department/service locations both externally and internally.

External Location Signage:

- Hospitals need to have one large external location sign with the “Name of Facility,” displayed at every main entry and exit point of the health facility.
- This sign should be positioned high enough to be visible to drivers and people entering the hospital.
- External signs need to be artificially illuminated to ensure visibility at night.
- “Emergency Department” signage should be illuminated in RED and prominently visible.
- Hospital layout with demarcated block-wise establishments needs to be displayed at the entrance.



External signage in front of the hospital

Internal Location Signage:

- Hospitals need to develop internal location signage for all departments/areas like OT, Panchakarma theatre, ward, pharmacy, OPD, etc.
- Location signs should be positioned for visibility and legibility from all directions of approach by all site users.

Directional Signages:

These signage's direct people to a destination using text and arrows.

External Directional Signage:

- Hospitals need to have external directional signage leading to the hospital from the main approach road.

- Such directional signages should be placed at strategic locations like major intersections, main connecting roads, and roundabouts on the way to the hospital.

Internal Directional Signage:

- These signage's should be placed inside the health facility to indicate directions to various establishments like the OPD block, parking area, emergency department**,** or departments located on a particular floor

Do's and don'ts for directional signages

Do's	Don't
Directional signs should have clear direction indicators – usually arrow	Avoid using unclear or misleading arrows which may cause confusion
There should be a directional (or locational) sign at each key decision point	Avoid trying to direct people back to the way they have come. The types of arrow used to convey this message are often difficult to understand
The direction the arrow is indicating should be easy to understand, and easy to relate to the actual environment	Avoid listing too many destinations on one sign
Directional signs should be consistently positioned so people know where to look for information	Avoid leaving too big gap between the text and arrow

Directories

- Hospitals should have departmental directories placed at appropriate locations within the hospital.
- Directories positioned on various floors should include all the services available on that particular floor.
- Directories can be positioned outside lifts or at building entrances.

Other Signages

In addition to directories, various other signages should be displayed, such as:

- Citizen Charter outlining patient rights and responsibilities.
- Rate lists.
- Contact details for higher referral centers.
- Emergency response numbers.

- Complaint redressal procedures.
- Scope of services and services not available.
- Major timings of the healthcare facility and departments.
- Contact numbers of key personnel in the facility

IEC Materials

Sufficient IEC posters should be displayed at appropriate locations throughout the healthcare facility.

- Outdated or irrelevant posters should not be displayed on the walls or boundaries of the healthcare facility.
- IEC materials should align with the scope of services provided by the health facility.
- These materials may cover topics such as:
    - Various health programs
    - Immunization schedules
    - Educational posters on handwashing
    - Preventive maintenance measures
    - Maternal and Child Health (MCH)
    - Health-related information
    - Disaster management

Different IEC materials displayed

Infrastructure Maintenance

Regardless of their initial quality, all healthcare facility buildings require regular maintenance and repairs to ensure a safe and functional environment. Proper maintenance practices are essential to preserve the integrity of these structures. This includes both immediate repairs and preventive measures to avoid long-term deterioration.

Maintenance of General Physical Structure

Day-to-Day Repairs

Routine maintenance tasks such as:

- Fixing drainage issues
- Restoring water supply
- Replacing blown fuses or faulty switches

These tasks are handled by healthcare facility staff using in-house /outsourced labor. Timely resolution of these issues ensures the smooth functioning of healthcare facility services.

Annual Repairs

Works of periodic nature, such as:

- Whitewashing, color washing, distempering, and painting (as per CPWD guidelines: every two years for white/color washing and three years for painting).
- Patch repair to plaster
- Minor repairs to various items of work
- Replacement of glass panes, wiring damaged due to accident, switches, sockets, tiles
- Gap filling of hedges, replacement/replanting of trees, shrubs, painting of tree guards, trimming of plants

These routine repairs are typically undertaken through a system of contracts. The facility staff must follow state government directives regarding maintenance schedules.
Some of these non-emergent works can be scheduled at any point within the financial year based on urgency and available resources.

Special Repairs

As the building ages, there is deterioration of various parts of the building and services. Major repairs and replacement of elements become inevitable. It becomes necessary to prevent the structure from deterioration and undue wear and tear as well as to restore it back to its original condition to the extent possible.
The following types of works in general are undertaken under special repairs:

- Whitewashing, color washing, distempers, etc. after completely scrapping the existing finish and preparing the surface afresh.
- Painting after removing the existing old paint.
- Provision of waterproofing treatment to the roof. All the existing treatments known are supposed to last satisfactorily only for a period of about ten years.
- Repairs of internal roads and pavements.
- Repairs/replacement of flooring, skirting, dado, and plaster.
- Replacement of doors, window frames, and shutters.
- Replacement of door and window fittings.
- Replacement of water supply and sanitary installation like water tanks, WC cisterns, wash basins, kitchen sinks, pipes, etc.
- Re-grassing of lawns/grass plots within 5-10 years.
- Renovation of lawns in 5-6 years.
- Replanting of hedges in 8-10 years.

The building services fixtures, including internal wiring, water supply distribution systems, etc., are expected to last for 20-25 years. Thereafter, it may be necessary to replace them after a detailed inspection.
The expected economic life of the building under normal occupancy and maintenance conditions is considered to be as below:

- Monumental buildings – 100 years
- RCC framed construction – 75 years
- Load-bearing construction – 55 years
- Semi-permanent structures – 30 years

- Purely temporary structures – 5 years

The life of the building mentioned above is only indicative and depends on other factors like location, utilization, specifications, maintenance, upkeep, and caretaking.

All three categories, i.e., day-to-day, annual, and special repairs/services, are interrelated. Neglect of routine maintenance and preventive measures may lead to more extensive periodical maintenance and, in the long run, major repair or restoration, which could have been avoided or postponed.

All three plans are to be carried out under direct supervision and should ensure the following in the health facility:

- There are no cracks, seepage, chipped plasters, or broken floors in the HCF.
- There are no broken windows and glass panes, and all the windows are guarded.
- There are no loose and hanging electrical wirings in the facilities.
- All electrical panels are placed inside closed cabinets, and there are no broken electrical panels in the facility.
- The health facility has an intact boundary wall with an adequate height to prevent unauthorized entry.
- The health facility does not have any growth of algae, mosses, or any vegetation on the roof and walls.
- The health facility, including boundary walls, is painted in a uniform color scheme(Branding of AHWCs as per guidelines).

Precautions for Periodic Maintenance

The following precautions need to be taken while framing, scheduling, or performing periodic maintenance of the health facility:

- Maintenance work needs to be carried out at times that minimize any adverse effect on the hospital's output or function.
- The program should be planned comprehensively to avoid multiple works at one site at different times.
- Maintenance work, completed or being carried out, should comply with all statutory and other legal requirements.
- All activities carried out under the periodic maintenance program need to be recorded and maintained by the health facility.

These records should include:

- Details of the work done
- Details of the person performing the activities
- Time frame of the activity
- Person responsible for validating the satisfactory completion of the work done

Maintenance of Healthcare Facility Parking

Ensuring ample parking space for staff, patients, visitors, and ambulances is essential for a healthcare facility. The maintenance of parking areas involves the following considerations:

- The entrance porch parking area should have a canopy to shield vehicles from all weather conditions.
- Designing the porch parking area to facilitate one-way traffic flow and accommodate at least two ambulances enhances disaster management capabilities.
- Properly marking parking spaces for ambulances and other vehicles is crucial.
- Ambulance parking areas should have canopies and be kept clear of regular traffic to facilitate ambulance movement.
- Parking spaces for patients, particularly those with disabilities, should be located as close to the building entrance as possible.
- Reserved parking spaces for individuals with disabilities should be designated in both public and staff parking areas.
- Directional signage should be installed for clear identification of parking spaces.
- Adequate illumination is necessary for parking areas.
- Employee parking should ideally be segregated and located separately.

Parking facility with signage

Illumination and Lighting in Healthcare Facilities

Healthcare facilities consist of multiple components serving diverse functions, including non-medical areas (such as offices, kitchens, laundries, and libraries) and specialized interiors (such as operation theatres, clinics, treatment rooms, and wards).

Each of these areas requires specific lighting techniques and fittings to achieve the desired standards in illumination, hygiene, electrical safety, reliability, and ease of maintenance.

Healthcare facilities should ensure that:

- There is adequate lighting in circulation areas, indoor spaces, procedural rooms, entrances, and healthcare facility access roads.
- Energy-efficient measures, such as the use of natural light and energy-efficient bulbs, are implemented.

These lighting guidelines are essential for maintaining proper visibility, safety, and energy conservation in healthcare facility environments.

Lighting in Patients' Rooms or Wards

Patients' rooms in a healthcare facility often account for more than half of the useful floor space. Proper lighting in these rooms is crucial to meet the needs of both patients and medical/nursing staff. Additionally, the overall lighting design should enhance the decor and be free from glare, ensuring comfort for recumbent patients.

Lighting for Medical and Nursing Staff

Lighting should be adequate to allow medical and nursing staff to perform their routine tasks efficiently. It should facilitate activities such as reading thermometers, preparing charts, and conducting bedside procedures.

- It is recommended that nursing stations be illuminated with at least 150-300 lux to ensure optimal visibility.

Lighting for the Patients

For patients in the wards, lighting should create a cozy and pleasant atmosphere. Lighting should be planned to meet the specific requirements of patients in a ward. For example, some patients may prefer to sleep before the scheduled "lights out" time, so a high level of illumination would be a nuisance to them.

Considering these requirements, a level of illumination of 100 lux is acceptable for general lighting in wards, which will also meet the needs of the nursing staff.

Apart from general lighting, individual patients can be provided with additional lights in the form of bed head lights, which can be switched on or off by the patients themselves. These lights also contribute to the general appearance of the wards by breaking the monotonous uniformity that may result from general lighting.

Examination Lighting

In emergencies, patient examinations may need to be conducted within the ward itself. For such situations:

- An examination light providing 1000 lux is required.
- A mobile examination lamp, which can be plugged into a bedside wall socket, is recommended instead of fixed bedside lamps, as their frequent use may not be necessary.

Night Lighting

After "lights out," complete darkness in the ward is not advisable. The lighting system should ensure:

- Sufficient visibility for nursing staff to monitor the ward at a glance.
- Safe movement for mobile patients to access the lavatory or other areas.
- Night lighting of about 1 lux is recommended for this purpose.
- Recommended Lighting Installation in Wards

General Lighting	100 lux
Nursing Stations	150-300 lux
Night Lighting	1 lux
Examination Lighting	1000 lux

Lighting requirements for corridors

Corridors in a Healthcare facility serve a more important function than in many other buildings because they act as transitional areas between wards and service rooms, as well as between naturally lit and artificially lit rooms. Doctors discuss their work with colleagues and make notes in these spaces, effectively making corridors a working area. Moreover, since corridors fall within the visual range of patients in the wards, they require special attention. The artificial lighting provided in the corridors depends on the architectural layout of the building.

Single Corridor Layout

In a 'single corridor' layout, the wards and service rooms are on either side of the corridor. This layout allows the corridor to receive sufficient daylight. In the evening, the corridor should have an illumination level of approximately 100 lux. However, after 'lights out,' the corridor must have a night lighting arrangement similar to that of the wards, with a minimum of 1 lux.

Double Corridor Layout

In a 'double corridor' or 'race track' layout, the wards are placed around the outside of the building and normally receive daylight, while the service rooms are located in the center of the building with no access to natural light, requiring artificial lighting at all times.

During the day, staff move between the naturally lit wards and the artificially lit internal rooms. The corridor should bridge these two levels, requiring an illumination level of 150 lux during the daytime. In the evening, the corridor should have an illumination level of 100 lux, matching the ward illumination level.

Lighting of Para surgical/Treatment areas

Lighting of Operating Theatres

The general lighting of procedure rooms should be at least 300 lux. This level of illumination is adequate for technical staff operating ancillary equipment in the operation theatres or minor OTs.

In the theatre, the visual requirement involves detailed examination of tissues, organs, and instruments at the site of the operation. The size of critical details is very small with very low contrast. It is recommended that the illumination level for lighting on the operating tables should be between 2000 and 10,000 lux.

Light Sources

Operating table light fittings typically employ tungsten lamps, which produce a very high level of illumination with excellent color rendering properties. However, filament lighting is not advisable for general theatre lighting due to its additional heat output. Instead, fluorescent light sources are preferred as they generate low heat output and provide good color rendering, which is essential for medical purposes.

Recommended illumination values and glare index

The recommended levels of illumination and glare index for different areas in a Healthcare facility are as follows:

Sl. No.	Classification	Illumination Lux	Limiting Glare Index
1.	Reception and WaitingRoom	150	16
2.	Wards • General • Beds	 100 150	 13 --
3.	Operation Theatre • General • Operation Table	 300 2000-10000	 10 --
4.	Laboratories	300	19
5.	Radiology Area	100	--
6.	Emergency and OPD Department	150	16
7.	Stairs and Corridors	100	--
8.	Dispensaries/Pharmacy	300	19

Illumination in front and on access road

Healthcare facilities need to ensure that the front of the Healthcare facility and the access road are well illuminated using street lamps. The lamps should be installed strategically to eliminate dark areas on the access road. Additionally, display boards for the Healthcare facility name and emergency department should be well-lit to enhance visibility.

Energy-efficient measures

Healthcare facilities must adopt energy-efficient measures while planning their lighting requirements. The following measures should be implemented:

- Adequate use of natural light/daylight.
- Use of energy-efficient bulbs such as CFL or LED.
- Limited use of artificial lights:
    - Switching off lights when not needed.
    - Defining and following "lights out" hours for different areas of the Healthcare facility.
    - Labeling switches to allow staff to use only necessary lights.

Maintenance of furniture and fixtures

Healthcare facilities must ensure that all furniture and fixtures are well maintained to provide a safe environment. The following minimum requirements should be met:

- All doors should be intact, painted, and varnished.
- Window panes should be intact and provided with safeguard grills and meshes.
- Patient beds should be well-maintained, with no broken parts or temporary arrangements for stability.
- Beds should be checked for rust deposition and painted regularly.
- Trolleys, stretchers, and wheelchairs should be equipped with safety belts, be intact, painted, and cleaned regularly.
- Wheels of stretchers, wheelchairs, and trolleys should be properly aligned and well-lubricated.
- All Healthcare facility furniture should be checked for broken parts, chipped paint, etc., and repaired accordingly.
- Preventive maintenance should include furniture and fixture upkeep.
- Anti-termite treatment should be conducted annually, as per pest and animal control guidelines.

Removal of junk materials

Public health facilities often accumulate junk, including unserviceable medical equipment, furniture, and electrical items. Such accumulation poses fire hazards and can lead to pest infestations. To ensure safety and efficiency, healthcare facilities should establish proper junk removal processes, categorizing items as follows:

- Surplus Items: Functional but unneeded items in certain sections or healthcare facility stores.
- Obsolete Items: Functional items that are outdated due to technological advancements.
- Unserviceable Items: Non-functional equipment beyond economic repair.

- Scrap: Process waste, broken items, and other materials with resale value.
- Empties: Empty containers, crates, bottles, plastic jars, and drums.

Healthcare facilities should implement a documented Condemnation Policy to prevent unnecessary accumulation and ensure timely junk removal.

Condemnation policy

All healthcare facilities should establish and implement a Condemnation Policy aligned with state-level guidelines (if applicable). The policy should ensure:

- A Condemnation Committee is formed in the healthcare facility to oversee junk material disposal.
- No junk material is stored in patient care areas, open areas, corridors, or critical service areas.
- A demarcated and secure storage space is allocated for junk materials before disposal.
- Junk disposal methods align with state government directives for safe and legal removal.

By adhering to these guidelines, healthcare facilities can maintain a safe, clutter-free environment, reducing hazards and ensuring efficient resource management.

Condemnation Committee

Healthcare facilities must establish a Condemnation Committee for the systematic disposal of junk materials. The committee should include representatives from various staff categories, as prescribed in the state-level condemnation policy. Suggested members include:

- Superintendent/Chief Medical Officer of the healthcare facility.
- Administrative officer
- Senior Medical Officer.
- Nursing Superintendent or senior-most nursing staff.
- Technical Professionals, such as Biomedical Engineers, Heads of Departments, suppliers, or service agencies.
- Accounts Department Representative (if available).
- Store In-Charge/Storekeeper.

Constitution of the committee

The composition of the Condemnation Committee may vary from one institution to another, depending on the availability of designated staff. Necessary modifications can be made by the Head of the Institution as required. The Condemnation Committee should meet at least once every six months or more frequently as needed.

Responsibilities of the Condemnation Committee

The key responsibilities of the committee include:

- Framing and implementing the condemnation policy at the healthcare facility.
- Conducting inspections across all facility areas to identify accumulated or junk materials.
- Determining the minimum upset price for tendering and public auction.
- Compiling and maintaining an inventory of items requiring condemnation.
- Maintaining records of junk materials stored for condemnation.
- Notifying all relevant personnel about upcoming condemnation activities.
- Approving the disposal of junk and unserviceable materials.
- Allocating a designated space for junk material storage before disposal.
- Ensuring compliance with relevant regulations, such as:
    - E-Waste Management Rules
    - Bio-Medical Waste (BMW) Management Rules

By adhering to these responsibilities, the Condemnation Committee ensures a structured approach to junk disposal, promoting hygiene, safety, and regulatory compliance.

Space for Junk Material

Healthcare facilities must ensure that a designated and secure area is available for storing junk materials before final disposal. Junk materials should be stored only in this designated space and not in patient care areas, open spaces, or critical service areas. This storage area should be:

- Secured with a lock and key.
- Equipped with fire safety measures, including fire extinguishers, smoke detectors, and fire alarms.

Condemnation Options

The Condemnation Committee may follow the condemnation options prescribed by the State Government or undertake the following steps:

- Offering the equipment to authorized vendors under the buy-back option.
- Selling junk through public auctions for items that meet the minimum upset price set by the healthcare facility.
- Disposing of junk through a tender process for items with a minimum upset price as determined by the healthcare facility.

Water Conservation

Water conservation refers to reducing water usage and recycling waste (used) water. It involves minimizing water losses, preventing water wastage, and increasing efficiency in water use. Effective water conservation policies, strategies, and activities help healthcare facilities sustainably manage water resources, protect the environment, and meet current and future water demands. Factors such as bed occupancy, healthcare facility size, and functional departments influence the healthcare facility's water conservation measures.

The minimum approach that a hospital can adopt for water conservation is as follows:

- Ensuring Adequate Quality & Quantity of Water
- Healthcare facilities must ensure that their water supply meets the required standards:
- For health facilities with fewer than 100 beds, the water requirement is approximately 350 litres per bed per day.
- For healthcare facilities with more than 100 beds, the requirement increases to 400 litres per bed per day.
- Healthcare facilities must calculate their total water requirements and ensure adequate storage provisions.
- Measures to ensure water quality include:
    - Regular cleaning of water tanks and reservoirs.
    - Routine maintenance of RO plants and water dispensing machines.
    - Periodic water testing for microbial contamination.
    - Chlorination of water.
    - Healthcare facilities must maintain records of water testing, tank cleaning, and dispensing system maintenance.
- Maintenance of Water Supply System
- Healthcare facilities must undertake regular maintenance of the water supply system as per their periodic maintenance plan.

Inspection for Water Wastage

Healthcare facilities should periodically check for:

- Leaking taps and pipes.
- Overflowing tanks.
- Dysfunctional cisterns.

Designated staff must be responsible for conducting these inspections. Immediate corrective actions must be taken to address any faults detected.

Promotion of Water Conservation

Healthcare facilities should actively promote water conservation by:

- Using IEC (Information, Education, and Communication) materials.
- Conducting periodic sensitization programs for staff on water conservation practices.

Water Requirements, Storage, and Quality Testing

- The details of water requirements, storage, and quality testing have been provided in the "Water Sanitation" section of these guidelines.

Rainwater Harvesting

Rainwater harvesting is the technique of collecting and storing rainwater at the surface or in subsurface aquifers before it is lost as surface runoff. Groundwater augmentation through the diversion of rainfall to subsurface reservoirs using various artificial recharge techniques can be adopted by the healthcare facility.

Healthcare facilities can also implement a twin strategy of simple artificial recharge techniques in rural areas, such as:

- Percolation Tanks
- Check Dams
- Recharge Shafts
- Dug Well Recharge
- Subsurface Dykes

Additionally, healthcare facilities in urban areas can adopt rooftop rainwater harvesting.

Rain water harvesting facility

Rooftop Rainwater Harvesting

Rooftop rainwater harvesting is the process of capturing rainwater from roof catchments and storing it in reservoirs. This harvested rainwater can be stored in subsurface groundwater reservoirs through artificial recharge techniques or used for household needs by storing it in tanks. The main objective of rooftop rainwater harvesting is to ensure water availability for future use. Capturing and storing rainwater is particularly important in dryland, hilly, urban, and coastal areas.

Need for Rooftop Rainwater Harvesting

- To meet the ever-increasing demand for water.
- To reduce runoff that chokes storm drains.
- To prevent flooding of roads.
- To augment groundwater storage and control declining water levels.
- To reduce soil erosion.
- To supplement domestic water requirements during summer and drought conditions.

Safety Considerations

Storage in Groundwater Reservoirs

- For rooftop rainwater harvesting through existing tube wells and hand pumps, a filter or desilting pit should be provided to prevent silting.
- Tube wells, if pumped intermittently, increase the efficiency of recharge.
- If the groundwater reservoir is recharged through shafts or dug wells, an inverted filter should be provided.

Storage in Tanks

- Storage tanks should not be located near sources of contamination, such as septic tanks.
- Tanks should be placed at a lower level than the roof to ensure complete filling.
- A rainwater system should include an overflow pipe that empties into a non-flooding area. Excess water may also be used for recharging the aquifer through dug wells, abandoned hand pumps, or tube wells.
- A speed breaker plate should be placed below the inlet pipe in the filter to prevent disturbance of the filtering material.
- Storage tanks should be accessible for cleaning.
- The inlet into the storage tank should be screened to allow for regular cleaning.
- Water should be disinfected before use for drinking purposes, either by chlorination or boiling.

Workplace Management

- Proper workplace management optimizes the use of resources, minimizes risks, and increases employee productivity based on service requirements.

Components of Workplace Management

- Sorting useful and unnecessary articles from the workstation.
- Arranging useful articles and records systematically.
- Labeling articles for easy identification.
- Cleaning workstations regularly.

Various techniques can be used by healthcare facilities for workplace management. One such technique is 5S, which improves the healthcare facility environment, particularly the workplace environment.

5S Technique

5S is a tool derived from Japanese methodology for improving the workplace environment. It consists of five steps. The five phases of 5S are derived from Japanese principles and translate as follows:

1. Sort (Seiri): Identify and remove unwanted/unused items to reduce clutter.
2. Set (Seiton): Organize necessary items in proper order for easy operation.
3. Shine (Seiso): Maintain a high standard of cleanliness.
4. Standardize (Seiketsu): Establish the above three steps as norms in every section of the workplace.
5. Sustain (Shitsuke): Train and maintain discipline among personnel.

Sort (Seiri)

- Remove unnecessary items and dispose of them properly.
- Eliminate obstacles to improve workflow.
- Reduce disturbances caused by unnecessary items.
- Prevent accumulation of redundant materials.
- Evaluate necessary items based on cost and utility.
- Segregate and remove unwanted materials from the workplace.
- A fully skilled supervisor should conduct regular checks.

Set/Systematic Arrangement (Seiton)

Also known as "Set in Order," "Straighten," or "Streamline":

- Arrange necessary items for easy access and use.
- Prevent loss and wastage of time.
- Ensure quick identification and retrieval of required items.
- Follow the "first-come, first-served" principle.
- Maintain a smooth and efficient workflow.
- Regularly conduct these activities to uphold orderliness.

Shine (Seiso)

Also known as "Sweep," "Sanitize," or "Scrub":

- Keep the workplace clean at all times.
- Use cleaning as a form of inspection.
- Prevent deterioration of machinery and equipment.
- Maintain a safe and easy-to-work environment.

Standardize (Seiketsu)

- Standardize best practices in workplace organization.
- Maintain high standards of housekeeping and workflow.
- Ensure orderliness, keeping everything in its designated place (e.g., chilled totes in chilled areas, dry totes in dry areas).
- Establish a standard process for every activity.

Sustain (Shitsuke)

- Keep workplace management in working order.
- Foster a culture of discipline and routine without external reminders.
- Conduct regular audits.
- Provide continuous training and development.
- Monitor training impact through monthly feedback sessions.

By implementing and sustaining the 5S methodology, AYUSH healthcare facilities can ensure a clean, efficient, and well-managed environment, ultimately leading to improved patient care and staff productivity.

Implementation of 5S in Healthcare Facilities

The implementation of 5S simplifies activities, reduces waste, and eliminates unproductive or unnecessary tasks. It also enhances quality, efficiency, and safety. Below are the steps to implement 5S in a healthcare facility setting.

1. Sort (Seiri)

Sort means separating and removing unnecessary items from the workplace. Without sorting, it is not possible to organize the workplace effectively.

Steps to Implement Sorting

Identification and Segregation of Unwanted Items

- The "Sort" activity starts with the identification of unwanted items in the workplace.
- If any unwanted items cannot simply be discarded/destroyed, they must be placed in a secured and demarcated space before the Condemnation Committee decides their disposal.

Initiation of Sorting

- Sorting may start from any part of the hospital. It may be good to start sorting from inside the hospital building. It should then be extended to the outer space (hospital premises) of the hospital building.
    - The indoor space, frontline (OPD, emergency, lab, pharmacy, etc.) and backyard (kitchen, laundry services, etc.) service sections are the primary targets of this activity at the beginning. No part of the hospital should be excluded from this activity. However, hospital management may prioritize the sections based on criticality of organization, visibility, and urgent needs.
    - During the activity, decisions may need to be taken to modify the physical structure of the room, wall, door, etc. This activity would require some funds, which the top management should support.
    - It is recommended that the staff identify unwanted items at their workstations and remove these unwanted items frequently.

Set (Seiton)

- “Set” is the second step of 5S and is mainly a process to put orderliness in every workplace for better work efficiency. The process starts once all the clutter and unnecessary items are removed from the workplace during the sorting stage. All the items needed at the workplace should be arranged in order based on an objective-oriented approach. For instance, items may be arranged according to alphabetical order or numerical order. All items should be kept in a specific place following a system so that anybody in need of these items can find them easily.

Steps to Implement Setting

- Posters and notices on the notice board should be arranged in a manner that avoids a messy situation. Old posters can be removed from workplaces. All necessary work instructions and notices should be pasted at identified places in a systematic manner.
- Color codes (different colors for different purposes, meanings, etc.) can be an effective visual tool for 5S. This helps with easy identification of items and prevents mistakes.
- Arranging necessary items at appropriate places with proper numbering, labeling, and color coding makes them easy to find quickly.

- Arranging items in correct alignments at appropriate places will provide an aesthetic appearance. For example, aligning beds systematically as per bed spacing norms will make the wards spacious and aesthetically pleasing.
- Numbering items will simplify the workplace.
    - For example, switchboards can have numbered labels for fan and light switches.
    - Numbering can also be used for registers, beds, room numbers, and hospital inventories.
- Name tags, boards, and symbols should be developed and installed as part of the "Set" process.
    - A proper and uniform signage system with pictorial representations will provide guidance to staff, patients, and visitors.
- Instruments and devices should be reviewed during the "Set" period.
    - Tagging and labeling of all instruments and devices should be done to identify them for specific locations.
    - It should be ensured that all items are kept near the point of use in an organized manner.
    - Demarcated spaces should be designated at workstations and storage areas for different items and articles.

Shine

"Shine" is a participatory activity aimed at maintaining cleanliness at every workplace, regardless of category and location. The following activities should be undertaken by the healthcare facility:

- All healthcare facility staff should be allocated a specific territory for this activity, including their working area.
- Regardless of category, rank, or gender, everyone is expected to participate in the "Shine" activity and take responsibility for cleanliness.
- All staff must ensure that workstations are clean and free of dust and dirt.
- Periodic implementation of "Shine" is crucial. The healthcare facility should set a daily, weekly, monthly, and quarterly schedule to maintain cleanliness. A daily morning "Shine" practice before starting routine work can be an example.
- A cleaning checklist should be systematically used in every work area.
- Regular supervision of cleaning activities should be undertaken by the healthcare facility.
- All equipment should be protected from dust and dirt through periodic and timely cleaning and should be appropriately covered during idle periods.
- "Shine" should also be implemented in waste segregation, collection, storage, transport, and final disposal systems.

Standardize

The "Standardize" stage of 5S focuses on developing standards for the initial 3S activities—Sort, Set, and Shine. The objective is to integrate these activities into the daily routine of all staff across all hospital sections. Once standards are set, they should be disseminated through visualization and sensitization activities. The following activities can be undertaken by the hospital:

- IEC materials (posters, leaflets, stickers, etc.) should be developed to disseminate information related to 5S. The materials should be eye-catching, highlight key messages through slogans, and be displayed at prominent locations visible to staff and visitors.
- Hospitals may adopt a standard colour coding system throughout the facility. AHWCs need to follow the branding guidelines.
- Monitoring and Evaluation (M&E) of workplace management activities should be conducted through regular supervisory visits to ensure proper implementation.
- M&E activities can be conducted on a defined schedule or as a surprise activity.

Sustain:

Healthcare facilities must ensure that all workplace management activities are sustained and adopted as part of the daily routine of staff. Training programs, including formal and hands-on sessions, should be conducted to enhance staff competency in managing workstations.

B) SANITATION AND HYGIENE

The hospital environment is a complex one and contains a large variety of microbial flora. Various parts of the hospital environment can harbor reservoirs of microbes, many of which pose an infection risk to patients, visitors, and healthcare workers.

Transmission of microbes from the environment to patients and healthcare workers through direct and indirect contact has been well documented. Surfaces with higher frequency of hand contact are more likely to be a source of infection than surfaces with a low degree of contact. Thus, high-touch surfaces (e.g., handles, bedside tables, etc.) in the patient care area pose a greater risk than low-touch surfaces such as walls and floors.

Patients undergoing procedures or those with immunity-lowering conditions are at higher risk of infection compared to those without such conditions. Therefore, proper sanitation and hygiene through cleaning and disinfection of hospital circulation areas, environmental surfaces, and patient care items are of significant importance in any healthcare setting.

The following criteria must be followed and implemented by hospitals to maintain proper sanitation and hygiene:

1. Cleanliness of circulation areas
2. Cleanliness of wards
3. Cleanliness of procedural areas
4. Cleanliness of ambulatory areas (OPD/Emergency/Lab)
5. Cleanliness of auxiliary areas
6. Cleanliness of toilets
7. Use of standard materials and equipment for cleaning
8. Use of standard cleaning methods
9. Monitoring of cleanliness activities
10. Drainage and sewage management

General Approach to Environmental Cleaning

Environmental cleaning and disinfection aim to eliminate, reduce, control, or isolate reservoirs of microorganisms in the healthcare facility environment.

From point 1 – 6 .please ref : Annexure SOP

Healthcare Facility Areas Categorized for Cleaning

1. General Areas – Spaces with general traffic but no admitted patients or patient care activities (e.g., corridors, parking areas, registration counters).
2. Patient Care Areas – All areas where patients are admitted and care activities are performed (e.g., wards, minor OTs, Panchakarma theatres, laboratories).

Sanitation and hygiene activities must be conducted according to the type of area to ensure effective infection control.

Factors Influencing Cleaning Frequency And Disinfection Level

To maintain healthcare facility hygiene and sanitation, the following factors should be considered:

A. Potential for Direct Patient Contact

Environmental surfaces serve as reservoirs of pathogens, and microbiologically contaminated environmental surfaces can contribute to the transmission of infections to both staff and patients. All surfaces in the hospital that may come into direct contact with patients should be cleaned more frequently using high- or low-level disinfectants, as appropriate for the type of area. Cleaning and disinfecting such surfaces is essential in reducing their potential role in hospital-acquired infections by eliminating reservoirs in the chain of infection.

B. Type of Surface and Orientation (Vertical/Horizontal)

Dry conditions favor the persistence of gram-positive cocci (e.g., coagulase-negative *Staphylococcus* spp.) in dust and on surfaces, whereas moist, soiled environments additionally support the growth and

persistence of gram-negative bacilli and fungi. Horizontal surfaces accumulate more dust and microbes, requiring more frequent cleaning than vertical surfaces.

C. Degree and Frequency of Hand Contact

- **High-Touch Surfaces**: These are surfaces that have frequent contact with hands, such as doorknobs, elevator buttons, telephones, bedrails, light switches, computer keyboards, monitoring equipment, hemodialysis machines, wall areas around toilets, and the edges of curtains in patient areas. The transmission of microbes from these surfaces to patients, directly or indirectly, is more likely. Therefore, they require more frequent cleaning.
- **Low-Touch Surfaces**: These surfaces have minimal contact with hands, including floors, walls, ceilings, mirrors, and window sills. The potential for infection transmission from these surfaces is low, and they require less frequent cleaning. However, they should be cleaned promptly when visibly soiled.

D. Potential for Contamination with Pathogens

The likelihood of contamination depends on activity type, microbial load, and exposure to blood or body fluids. Based on contamination levels, healthcare facility areas can be classified as follows:

- **Heavy Contamination**: Surfaces and/or equipment exposed to large amounts of blood or other body fluids, such as those in operating theaters (OTs), labor rooms, autopsy rooms, cardiac catheterization laboratories, burn units, hemodialysis units, casualty departments, and bathrooms used by patients with diarrhea or incontinence.
- **Moderate Contamination**: Surfaces and/or equipment contaminated with blood or other body fluids as part of routine activity, such as in patient rooms and bathrooms. Contaminated substances, such as soiled bed sheets, are contained or removed. All patient rooms and bathrooms should be considered at least moderately contaminated.
- **Light Contamination**: Areas where surfaces are not exposed to blood, other body fluids, or items that have come into contact with them. Examples include lounges, libraries, offices, and general traffic areas.

E. Nature of Activity (Critical Care vs. General Use)

- The nature of activity influences exposure risk. For example, critical care areas require more stringent cleaning than meeting rooms or administrative offices.

F. Vulnerability of Persons Present in the Area

- Susceptibility to infection varies among different types of patients.
- **More Susceptible:** These are patients who are more susceptible to infection due to their medical condition or lack of immunity. These include those who are immune-compromised neonates; those who have severe burns; and those undergoing procedures are also more susceptible to infection. Patients with peripheral IV cannulation, urinary catheter insertion, and intramuscular injections are excluded from this category unless they have some medical condition causing lack of immunity.
- **Less Susceptible:** For the purpose of risk stratification for cleaning, all other individuals are classified as less susceptible.

Classification of healthcare facility areas into risk categories

All healthcare environments should pose minimal risk to patients, staff, and visitors. However, different functional areas represent varying degrees of risk and, therefore, require different cleaning frequencies and levels of monitoring and evaluation.

A functional area refers to any space in a healthcare facility that requires cleaning. Consequently, all functional areas should be classified into one of the following three categories:

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

Regular monitoring should be conducted in areas where standards are considered poor or where routine monitoring reveals consistent weaknesses. These functional area risk categories are explained below:

High-Risk Areas:

- Consistently high cleaning standards must be maintained in these areas, requiring intensive and frequent cleaning with high-level disinfectant (HLD) (aldehyde-based).
- Patient care areas and other facilities designated as high-risk should be routinely monitored by the Healthcare Facility Administrator, housekeeping supervisor, and in-charge nursing staff.

- High-risk functional areas typically include:
    - Operating Theatres (OTs)
    - Panchakarma theatres
    - Emergency departments, if applicable
    - Other facilities where procedures are performed
- Bathrooms, toilets, staff lounges, offices, and other areas adjoining high-risk functional areas should be treated as having the same risk category and receive the same intensive levels of cleaning.

Moderate-Risk Areas:

- These areas should be maintained by regular and frequent cleaning, with 'spot cleaning' in between using HLD.
- Weekly monitoring should be conducted by the Healthcare Facility Administrator, while daily monitoring should be carried out by the housekeeping supervisor and in-charge nursing staff.
- Moderate-risk areas may include:
    - Medical wards
    - Laboratory areas
    - Pharmacies
    - Dietary services
    - Laundry services
    - Nurses' and doctors' restrooms
- Bathrooms, toilets, staff lounges, offices, and other areas adjoining moderate-risk functional areas should be treated as having the same risk category and receive the same regular levels of cleaning.

Low-Risk Areas:

- High standards are required in these areas primarily for aesthetic and hygiene reasons. Regular and frequent cleaning with 'spot cleaning' in between using moderate to low-level disinfectants is sufficient.
- These areas require fortnightly monitoring by the Hospital Superintendent/CMO/RMO and daily monitoring by housekeeping supervisors and in-charge nursing staff.
- **Low-risk functional areas may include:**
    - Administrative offices
    - Seminar rooms
    - Stores
    - Staff rooms
    - Non-sterile supply areas
    - Record rooms
- Additional internal areas such as bathrooms, staff lounges, and offices adjoining low-risk functional areas should be treated as having the same risk category and receive the same regular levels of cleaning.

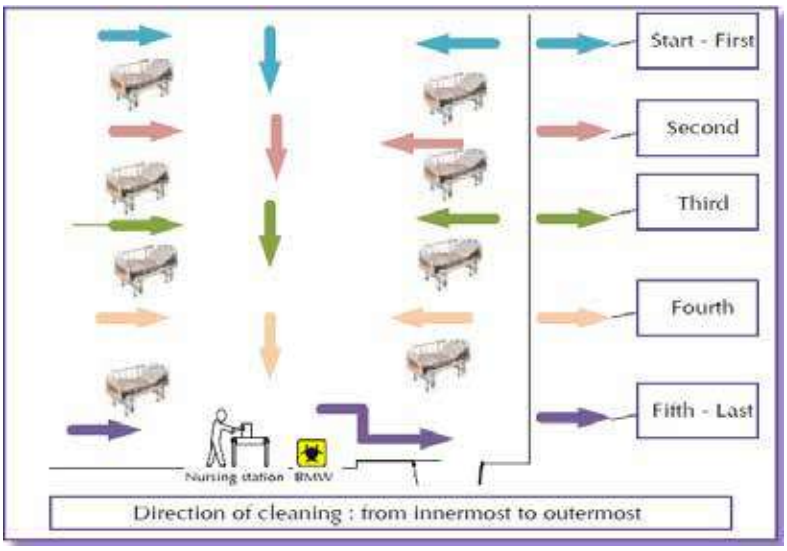
Cleaning and disinfection are dynamic in the sense that the practices in a given location may change with the nature of patients admitted. For example, a ward may be an area of low risk most times, but in case of a diarrheal disease or swine flu outbreak, the same ward will now be a medium-risk area due to the presence of these patients. The environmental cleaning and disinfection protocols should be changed accordingly. Hence, the classification of a patient care area should be reviewed in such situations.

Cleaning and disinfection in healthcare facility environments

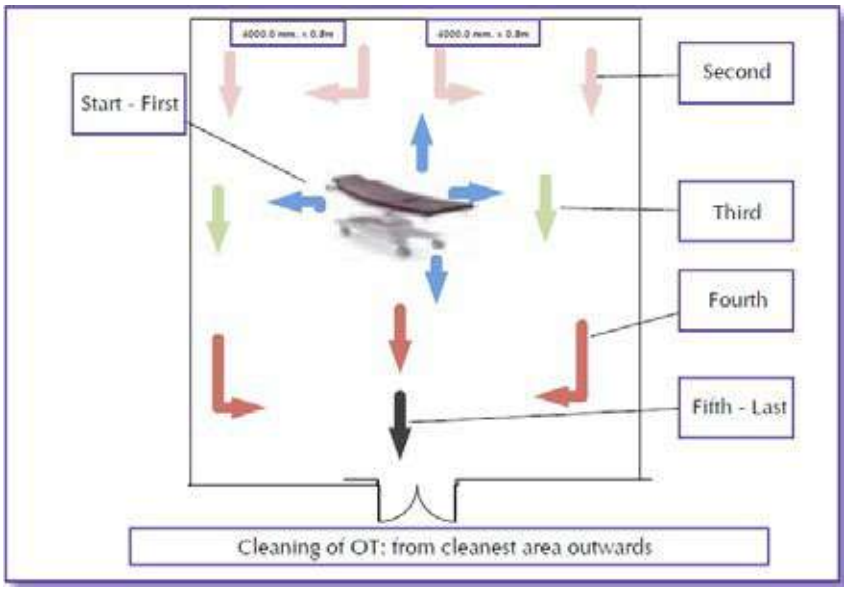
Human movement, equipment, and air circulation continuously alter the microbial population, making it highly dynamic. Various surfaces can serve as reservoirs for microbes, posing an infection risk to patients, visitors, and healthcare workers.

Transmission of infections within healthcare facility settings differs from community transmission and can have severe consequences. Microbes can spread through direct and indirect contact with contaminated environments. High-touch surfaces (e.g., door handles, bedside tables) pose a greater infection risk than low-touch surfaces (e.g., walls, floors). Patients undergoing procedures/treatments or those with immunosuppressive conditions are at higher risk of infection.

Thus, cleaning and disinfection of environmental surfaces and patient care items are critical in healthcare settings.



Direction for cleaning



DirectionforOTcleaning

Cleaning and disinfection frequency and level be followed in various area of the hospital

Location	Risk classification	Routine cleaning frequency	Additional cleaning	Disinfection level required	Reagents to use
Emergency treatment area	High risk	At least twice a day At fixed times	Yes	High	Aldehyde based
General public areas	Low risk	At least twice a day At fixed times	As required	Only cleaning/ low level disinfection	Only soap/ QUAT
Laboratory	Medium risk	At least twice a day At fixed times	As required	High	Aldehyde based
Offices	Low risk	At least twice a day At fixed times	As required	Only cleaning/ low level disinfection	Only soap/ QUAT

Operation theatre/Panchakarma theatres	High risk	- Start of the day - Between cases - end of the list - detailed wash-down	Yes	High	Aldehyde based
General ward	Medium risk	At least twice a day At fixed times	As required	High	Aldehyde based
Patient rooms (Patient not on isolation precautions)	Low risk	At least twice a day At fixed times	As required	Low	QUAT
Patient rooms (Patient on isolation precautions)	Medium risk	At least twice a day At fixed times	Yes	High	Aldehyde based
Pharmacy	Low risk	At least twice a day At fixed times	As required	Low	QUAT
Physiotherapy	Low risk	At least twice a day At fixed times	As required	Low	QUAT
Procedure rooms	High risk	At least twice a day At fixed times	Yes	High	Aldehyde based
Radiology	Low risk	At least twice a day At fixed times	As required	Only cleaning/ low level disinfection	Only soap/ QUAT
Reception area	Low risk	At least twice a day At fixed times	As required	Only cleaning/ low level disinfection	Only soap/ QUAT
Soiled linen collection area	Medium risk	At least twice a day At fixed times	As required	High	Aldehyde based

General Cleanliness Requirements

The healthcare facility must ensure the following minimum cleanliness standards:

- No visible dirt, grease, or stains on healthcare facility surfaces, including rooftops, floors, and walls.
- No cobwebs, bird nests, or pest infestations.
- No water seepage on walls or roofs.
- Patient mattresses, furniture, and fixtures are free from grease and dust.
- No foul smell in any healthcare facility area.
- Floors are kept dry; when wet mopping is used, appropriate safety measures (e.g., 'Wet Floor' signage) are implemented.
- Adequate cleaning and disinfection materials and equipment are available for different areas.
- Standard cleaning methods are applied appropriately to different healthcare facility areas.
- Regular monitoring of cleanliness activities is conducted, with corrective actions taken as needed.
- Drainage and sewage systems are well-maintained to prevent leakage or blockages.

General cleaning practices for all healthcare settings

Before Cleaning:

- Check for isolation precautions.
- Follow designated precautions.
- Remove clutter before cleaning.
- Prepare cleaning and disinfecting solutions per manufacturer instructions.
- Ensure all cleaning equipment is clean before use.
- Perform hand hygiene before entering the room.
- Prepare chemical dilutions and wear gloves before starting.

During Cleaning:

- Clean from least soiled to most soiled areas, and from high to low surfaces.
- Remove gross soil before cleaning and disinfection.
- Minimize turbulence to prevent dust dispersion.
- Never shake mops.
- Use a dust-control mop before wet mopping. Do not use brooms.
- Wash mops under running water before wet mopping.
- Avoid 'double-dipping' mops to prevent contamination.
- Mop 120 square feet before re-dipping into the cleaning solution.
- Change the cleaning solution after every 240 square feet (more frequently in critical areas like OT and Panchakarma theatres).
- Change solutions immediately when visibly soiled or after cleaning blood and body fluid spills.
- Be cautious of needles and sharp objects; dispose of them safely in puncture-proof containers and report incidents to supervisors.
- Collect waste carefully; handle plastic bags from the top without compressing them.
- Perform hand hygiene after leaving the room.

After Cleaning:

- Avoid overstocking rooms.
- Clean and dry cleaning tools between uses.
- Launder mop heads daily.
- Dry all cleaned mop heads thoroughly before reuse.
- Sanitize cleaning carts and biomedical waste transport carts daily.

Materials and Equipment For Cleaning

Healthcare facilities must ensure the regular availability of all disinfectants, cleaning materials, and equipment to meet the facility's cleaning requirements.

General Requirements

- The healthcare facility should maintain a list of standard cleaning and disinfecting materials.
- The efficacy of these materials should be checked to meet the disinfection requirements for specified areas in the healthcare facility or for specific uses, such as surface disinfection and equipment cleaning.
- The healthcare facility should ensure that all disinfectants and cleaning materials are approved by an appropriate authority to validate their efficacy.
- The hospital must ensure that all staff use the correct concentration of cleaning solution. For this purpose, housekeeping staff should be trained in the preparation of cleaning solutions, and records of the same need to be kept.
- A chart showing the name of the chemicals, dilutions to be used, areas where they are permitted for use, and their intended application (e.g., floor/equipment/blood spill cleaning) should be prepared and placed in all areas of the hospital.
- The healthcare facility should have an adequate number of buckets, carts, and cleaning equipment to meet its cleaning needs.
- Separate equipment must be used for cleaning general and critical areas.
- Healthcare facilities with a bed capacity exceeding 300 beds should have a mechanized mopping machine for cleaning the premises.

Selection of disinfectants

There is no ideal disinfectant; the best option should be chosen based on the situation. A disinfectant solution is appropriate when it provides a satisfactory balance of antimicrobial activity, required disinfection level, toxicity, ease of use, and cost.

General Principles for Using Healthcare Facility Disinfectants

- Surfaces must be free from visible soil and other contaminants (e.g., adhesive products) before applying disinfectants, as these may interfere with disinfectant action.
- Healthcare facility-approved disinfectants may be used for equipment that contacts intact skin.

- Disinfectants must be used according to the manufacturer's instructions regarding dilution and contact time.
- Contamination of disinfectant solutions and cleaning equipment should be minimized. Proper dilution, fresh preparation, frequent solution changes, and avoiding "double-dipping" (dipping a soiled cloth into disinfectant solution) should be ensured.
- Appropriate personal protective equipment should be worn based on the products used.
- A quality monitoring system should be in place to assess disinfectant efficacy over time. Vendors may be asked to provide a quality test certificate for each batch for healthcare facility records.

Important Considerations

The physical characteristics of disinfectants should be considered before selection. For example:

- **Alcohol** is a rapid-acting intermediate disinfectant but is unsuitable for large surface disinfection due to rapid evaporation and flammability.
- **Chlorine** is a cost-effective high-level disinfectant (HLD) but is highly corrosive to metals at required concentrations.
- If a disinfectant is used for purposes beyond those mentioned, guidance should be obtained before making a decision.

Dilution of cleaners and disinfectants

Reagent	Dilution	Application
• HLD–aldehyde based(product preferably should not release formaldehyde gas – so plain formalin solution should not be used) • Example product-Bacillocid	• Daily use (OT and other critical areas): Add 7 ml of the concentrateperlitreofwater.* • Used once a week(OT only):Add 20 ml per litre of water. • Used2-3timesaweek (OT only): Add 10ml per litre of water.* • For disinfection of blood body spills: Add10mlperlitreofwater (1%)*. • ***Kindly refer to manufacturer instructions also before use***	For high-level disinfection of surfaces in critical areas. Can also be used for disinfection of blood and body fluid spills on metallic& non-metallic surfaces.
• Low level disinfectant • (any product with 4th or 5th generation Quaternary • ammonium compound with demonstrated resistance to inactivation by hard water)– • product to be finalized	As per manufacturer	For cleaning and disinfection in semi-critical areas. Can also be used in general areas.
• Chlorine • (Chorine releasing granules containing chlorine dioxide/ Sodium dichloroisocyanurate (NaDCC) preferable). • Example product–Isochlor granules. • If this is not possible, Sodium hypochlorite solution with a minimum basic concentration of 5.25to6.15% can be used) • Note: Bleaching powder should be avoided as it leaves powder residues on the surfaces.	• Important: Irrespective of the chlorine formulation used, the final concentration mentioned in parts per million (ppm) of chlorine should be adhered to. • Granules: as per manufacturer recommendation (add the number of grams of granules to measured quantity of water). • Sodium hypochlorite: • For small blood-body fluid spills (less than 10ml) – use a 1:100 (1%) dilution (500 ppm free chlorine). • For large blood–body fluid spills (more than 10ml) – use a 1:10 (10%) dilution (5000 ppm free chlorine). • For linen disinfection: Use a1:100 (1%) dilution (500 ppm free chlorine) with immersion for 5 minutes. Rinse with plain water immediately.	• For disinfection of soiled linen, liquid biomedical waste. Can also be used for disinfection of blood and body fluid spills on non-metallic surfaces. • For disinfection and odor minimization of toilets. • For disinfection of selected patient care equipment (non-metallic) such as oxygen humidifier bottles, bedpans, urine pots.

Any good quality liquid soap	Add enough soap to water to give a soapy feel. Avoid too much foaming or prepare as per manufacturer recommendation.	For general cleaning and removal of dust and organic matter on environmental surfaces and equipment.

Dilution chart for liquid sodium hypochlorite (Minimum 5% concentration available in original solution)

Original concentration	Dilution (prepared)	Chlorine in ppm	Recommended use
Minimum5%	**None**	**50,000 ppm**	
	1:10 (10%)	5000	Disinfection of large blood/body fluid spills
	1:100 (1%)	500	Wiping metallic surfaces on a regular basis, wiping after cleaning a small blood spill.
	1:200 (0.5%)	250	Cleaning equipment disinfection

Important: The original bleach/hypochlorite solution should contain a minimum of 5% sodium hypochlorite or 50,000 ppm available chlorine for the diluted solution to contain the ppm mentioned in the chart. Hypochlorite solutions are unstable and tend to lose 40-50% of free available chlorine over one month, even when stored in an opaque plastic container. Hence, the expiry dates mentioned by the manufacturer should be strictly followed.

Cleaners and disinfectants for use in healthcare settings

Commonly used cleaning and disinfecting materials include:

- Soap
- Alcohols (60-90% ethyl, isopropyl, or denatured ethyl alcohol)
- Iodophors
- Quaternary Ammonium Compounds (QUATs)
- Chlorine and Chlorine Compounds:
    - NaDCC (Sodium dichloroisocyanurate)
    - Calcium Hypochlorite
    - Sodium Hypochlorite (‘bleach’)
- Phenolics
- Aldehydes (for environmental and equipment disinfection as per product guidelines)
- Hydrogen Peroxide (used only as an antiseptic)

Soap

Soaps are generally alkaline compounds used to remove dirt and organic matter from surfaces. They act mainly by loosening the dirt and organic matter from the surface. Hence, the mechanical action of scrubbing/brushing followed by a water rinse is important when using soap for cleaning any surface. Soap has little or no antimicrobial activity. Soap solutions can allow the growth of bacteria when used for environmental cleaning; they should be prepared just before use, used immediately, and the leftover discarded.

Soap can be used to clean large environmental surfaces to remove dirt, organic matter, grime, oils, and residues of disinfectants. It is cheap, easily available, and along with proper mechanical scrubbing/brushing, can remove almost 80-90% of microbes on a surface. The surfaces should be adequately rinsed to remove all soap residues. This increases the effectiveness of subsequently used disinfectants.

Alcohols

In healthcare settings, “Alcohol” generally refers to two water-soluble chemical compounds – ethyl alcohol and isopropyl alcohol. Alcohols are rapidly bactericidal rather than bacteriostatic against vegetative forms of bacteria; they also are tuberculocidal, fungicidal, and virucidal but do not destroy bacterial spores. The optimum bactericidal concentration is 60%–90% solutions in water (volume/volume). The most feasible explanation for the antimicrobial action of alcohol is the denaturation of proteins.

Alcohols can be used for disinfecting small surface items such as thermometers, stethoscopes, equipment buttons, and rubber stoppers of medication vials. The main use of alcohol in healthcare settings is as an antiseptic and for disinfection of small items/surfaces. Alcohols are not recommended for sterilizing medical

and surgical materials, principally because they lack sporicidal action and cannot penetrate protein-rich materials.

They should not be used to clean/disinfect large surfaces as they evaporate quickly, leading to unreliable disinfection. They can also denature and fix proteins to the surface. Alcohols are highly flammable – they should be stored in a cool, ventilated area and should not be used near an open flame. They damage the shellac mountings of lensed instruments, tend to swell and harden rubber and certain plastic tubing after prolonged and repeated use, bleach rubber and plastic tiles, and damage tonometer tips.

Iodophors

An iodophor is a combination of iodine and a solubilizing agent or carrier; the resulting complex provides a sustained-release reservoir of iodine and releases small amounts of free iodine in aqueous solution. The free iodine is responsible for the antimicrobial action. The best-known and most widely used iodophor is povidone-iodine. Iodophors are bactericidal, mycobactericidal, and virucidal but require prolonged contact times to kill certain fungi and bacterial spores (weak sporicidal activity). In a hospital, they are often used for **"Part Preparation"** prior to surgery or any invasive procedure. Antiseptic preparations of iodophors should not be used as environmental or equipment disinfectants because of concentration differences and surface staining.

Quaternary Ammonium Compounds (QUATs)

Chemically, the quaternaries are organically substituted ammonium compounds. Examples of the chemical names of quaternary ammonium compounds are Benzalkonium Chloride, Benzethonium Chlorite, and Cetrimide. The quaternaries can be used in ordinary environmental sanitation of noncritical surfaces (e.g., floors, furniture, and walls) and for disinfecting medical equipment that contacts intact skin (e.g., blood pressure cuffs). Although QUATs are widely used as disinfectants, they should not be used to disinfect patient care items such as catheters and cystoscopes, as infections have been reported from such use.

The quaternaries are good cleaning agents, but high water hardness and materials such as cotton and gauze pads can make them less microbicidal because of insoluble precipitates, or cotton and gauze pads absorb the active ingredients, respectively. As with several other disinfectants (e.g., phenolics, iodophors), gram-negative bacteria can survive or grow in them. Therefore, cleanliness in preparation and immediate use are important practices to be followed in their use. Prepared solutions should not be stored for extended periods of time.

Chlorine and Chlorine Compounds

Chlorine products are available as liquids or solid powders. The strength of a chlorine solution is expressed in ppm of free chlorine. They have a broad spectrum of antimicrobial activity, do not leave toxic residues, are unaffected by water hardness, are inexpensive and fast-acting, remove dried or fixed organisms and biofilms from surfaces, and have a low incidence of serious toxicity. NaDCC (Sodium dichloroisocyanurate) should be the preferred choice. The use of powder/granules should be prioritized over liquid preparations due to significant differences in storage requirements, shelf life, and potency.

Sodium hypochlorite ('bleach') should be the last choice if other chemicals are not available. Hypo is unstable, and the disinfection efficacy of the final prepared solution varies widely. If used, it should be procured within one month of manufacture and used as soon as possible. The can label should mention the manufacture and expiry dates, batch number, and concentration (minimum 5%). Disadvantages of hypochlorite include corrosiveness to metals in high concentrations (>500 ppm), inactivation by organic matter, discoloration or "bleaching" of fabrics, release of toxic chlorine gas when mixed with ammonia or acid (e.g., household cleaning agents, urine), and relative stability. In general, solid powders with these contents should be preferred over liquid hypochlorite.

Phenolics

These groups of disinfectant chemicals have a carbolic acid base, derived from coal tar. Chlorinated fractions and petroleum residues are added to improve their cleansing and physical properties. Usually, they are black or white fluids. Phenolics are mostly used for floor and wall cleaning and can also be used for hard surfaces and equipment that do not touch the mucous membrane (e.g., IV stands, wheelchairs, beds, etc.). They are more potent than iodophors. However, they are irritant to the skin and mucosa and corrosive to metal surfaces. White fluids are emulsified suspensions and precipitate on surfaces, making subsequent cleaning difficult. Phenolics are not recommended for use in nurseries and food contact surfaces. Although this is a

traditional disinfectant, it is damaging to the environment. It is recommended that this chemical should be phased out as soon as possible.

Aldehydes

The biocidal activity of aldehydes results from the alkylation of sulfhydryl, hydroxyl, carboxyl, and amino groups of microorganisms, which alters RNA, DNA, and protein synthesis. They have very good bactericidal, virucidal, fungicidal, and sporicidal activity and are often used as HLDs. Aldehydes are generally non-corrosive to metal and do not damage lensed instruments, rubber, or plastics.

Hydrogen Peroxide

Hydrogen Peroxide is popularly used in disinfecting equipment and environmental surfaces. It is effective against viruses. However, using it to clean blood from surfaces and linen is not recommended as it is very costly and corrosive. It can be used for cold sterilization of heat-sensitive critical items, requiring 30 minutes at 20°C. It has rapid action and is non-toxic.

Preparation and Handling of Cleaners and Disinfectants

- Prepare dilutions in a well-ventilated area. The smell of the concentrated solution should not linger.
- Wear utility gloves when handling chemicals.
- Ensure that the bottle, bucket, and measuring instruments (cup, syringe, tumbler, etc.) are clean.
- Prepare working solutions just before use and only in the required quantity.
- All dilutions should be prepared by measurement. Mark the container with insulation tape.
- Use a syringe or suitable measuring apparatus for accurate dilution.
- Chlorine solutions should be prepared in an opaque container with a tight cap and kept away from direct sunlight and heat.
- Prepare disinfectant solutions (except chlorine) in a transparent bottle. A mineral water bottle or any cost-effective plastic bottle may be used.
- When preparing the working solution, first fill the bottle with water and then add the chemical/soap. Keep the cap tightly closed during transport.
- Clearly label all prepared solutions with the date, time of preparation, and the name of the solution.
- Do not puncture the cap. To sprinkle or pour, loosen the cap by a couple of turns.
- During use, always place chemical containers on the floor, never on tables, trolleys, or chairs.
- Cap all bottles and cans tightly when not in use.
- At the end of 12 hours or when empty, wash all bottles, containers, and caps with soap and water, rinse well, and allow them to dry before reuse.
- Change bottles weekly or when they appear soiled or dirty.

Characteristics of the main disinfectant groups

OPTION	USES	ADVANTAGES	DISADVANTAGES
Alcohols(60-90% ethanol/Isopropyl alcohol)	• External surfaces of some equipment (e.g., stethoscopes, oral and rectal thermometer) • Disinfect small surfaces such as rubber stoppers of multi-dose vials • Non-critical equipment used for home healthcare • Disinfection is achieved after 10 minutes of contact	• Non-toxic • Low cost • Rapid action • Non-staining • No residue • Readily available	• Evaporates quickly -not a good surface disinfectant • Evaporation may diminish concentration • Flammable - store in a cool well-ventilated area • May dissolve lens mountings • Hardens and swells plastic tubing • Harmful to silicone causes brittleness • May harden rubber or cause deterioration of glues • Inactivated by organic material

Chlorines (e.g., sodium hypochlorite or bleach, calcium hypochorite, sodium dichloroisocyanurate)	• Used decontaminating soiled linen ,infected plastic waste • Non-critical equipment used for home healthcare • Blood spills(use1% sodium hypochlorite for a minor blood spill and 10% for a major blood spill	• Low cost • Rapid action • Readily available • Available as liquid, tablets or powders	• Corrosive to metals • Do not use to disinfect surgical instruments • Inactivated by organic material; for blood spills, blood should be removed prior to disinfection • Irritant to skin and mucous membranes • Should be used immediately once diluted • Use in well-ventilated areas as chlorine may release gas especially with hypochlorite • Must be stored in closed containers away from ultraviolet light and heat to prevent deterioration • Stains clothing and carpets • Causes bleaching of fabrics • Cannot be mixed with soap
Glutaraldehyde	• Mostly used as high level disinfectant	• Good material compatibility	• Allergic, fumes are irritating to skin and respiratory tract
Phenolics	• Floors, walls and furnishings • Only for environmental surfaces not in direct contact with the patient	• Commercially available with added detergents to provide one step cleaning and disinfecting • Slightly broader spectrum of activity than QUATs • Weak activity against gram negative organisms • No antiviral activity	• Do not use in nurseries or equipment contacting infants (e.g. baby scales) • Leaves residual film on environmental surfaces • Not recommended for use on food contact surfaces • May be absorbed through skin or by rubber • May be toxic if inhaled, corrosive • Harmful to the environment
Quaternary ammonium compounds (QUATs)	• Floors, walls and furnishings in non critical areas	• Non-corrosive, • non-toxic, low irritant • Good cleaning ability, usually have detergent properties • May be used on food surfaces	• Do not use to disinfect instruments • Limited use as disinfectant because of narrow microbicidal spectrum • Diluted solutions may support the growth of micro-organisms • May be neutralised by various materials (e.g. cotton gauze)
Iodophors (non-antiseptic formulations)	• Hydrotherapy tanks • Thermometers • Hard surfaces and equipment that do not touch mucous membranes (e.g., IV stands, wheelchairs, beds, call bells)	• Rapid action • Non-toxic	• Corrosive to metal unless combined with inhibitors • Inactivated by organic materials • May stain fabrics and synthetic materials

	• DO NOT use antiseptic iodophors as hard surface disinfectants		
Hydrogen peroxide 7.5%	• Can be used for cold sterilisation of heat sensitive critical items • Requires 30 minutes at 20oC • Should be used as antiseptic only	• Rapid action • Safe for the environment • Non-toxic • No odour	• Contraindicated for use on copper, zinc, brass, aluminium • Store in cool place, protect from light • Costlier than other environment high-level disinfectants

Storage of Cleaners and Disinfectant Chemicals

- All prepared solutions should be clearly labeled.
- Store cleaners and disinfectant chemicals in a designated location.
- Store inflammable substances on lower shelves.
- Keep storage out of reach of children, preferably at or above adult shoulder height.
- Use a closed cupboard with a lock in a cool place away from direct sunlight and heat sources.
- Follow the first-in, first-out principle for chemicals with multiple containers.
- Attach biohazard labels to cupboards and chemical containers.
- Keep bottles and cans tightly closed when not in use.
- Dispose of discarded chemicals according to the manufacturer's instructions.

Equipment for Cleaning

- **Cleaning trolley/bucket** – It is preferable to have three-bucket trolleys with a wringing mechanism. Prefer a light-colored bucket to enable earlier detection of soiling of the water. The trolley should have provisions to store bottles of disinfectant, hand mops, and stick mops. A separate storage space for used hand mops should be available on the trolley. Ensure the trolley/bucket is clean before using it for cleaning work. The three-bucket system should ideally be practiced.

- **Three-Bucket System:**
    1. First bucket: Water with detergent for initial cleaning.
    2. Second bucket: Rinse the mop.
    3. Third bucket: Contains disinfectant for final mopping.

Three bucket system of cleaning

- **Wet Mops:** Microfiber mops are preferable. If using other types, choose non-linting material. Separate mops should be used for critical, semi-critical, and general areas, with color coding for easy differentiation.
- **Dry (dust) mops** to remove gross debris; brooms are not allowed in patient care areas. Mops used in critical, semi-critical, and general areas should be separate. Color coding should be used to help staff differentiate easily.
- **Long-handled dust mops** should be available for cleaning cobwebs and lint from the ceiling. These can be prepared by using any long wooden stick and tying a mop to one end. The mop should be tied in a way that allows wiping with pressure.
- **Rubber floor wipers** for toilet floor cleaning. Handheld rubber wipers for cleaning kitchen countertops and another set for toilet wall cleaning.
- **Hand Mops:** Used for equipment cleaning. Microfiber mops are preferable. They should be large enough to be palm-sized when folded twice. Separate mops should be used for different areas, with color coding for easy differentiation.
- **Dust Pans:** Used to collect particulate waste. Waste should be pushed into the pan using stiff cardboard or plastic.
- **Utility Gloves:** Available in long and short arm sizes, properly fitted.
- **Water:** Preferably use drinking-quality water for preparing cleaning solutions and rinsing mops. If water quality is uncertain, filter it using a cotton mop or sheet and disinfect it with chlorine before use.
- Brooms should never be used in patient care areas.

Note on Microfiber Mops: Microfiber mops are more efficient at cleaning, using less water and chemicals. Although they are costly, they should be preferred whenever possible. If used, it should be remembered that the cleaning and disinfection of these mops are different from cotton mops and should be set up accordingly. Otherwise, the benefit of microfiber cleaning will be lost. Properly used and maintained mops have been shown to reduce cleaning costs in the long term.

Care and Storage of Cleaning Equipment
Cleaning and Disinfection of Cleaning Equipment
Cleaning and Disinfection of Mops, Buckets, and Trolleys

- All used wet mops, buckets, and trolleys should be washed with soap and water at least once at the end of the day.
- Mops should be laundered in hot water (70-80°C) or soaked in clean water with bleaching powder 0.5% for 30 minutes. Wash with detergent and water to remove the bleach.
- If the mop/bucket/trolley is used for multiple cleaning sessions during the day, it should be washed and disinfected before each cleaning session begins (e.g., morning, afternoon, evening session).
- There is no need to disinfect the bucket/trolley when changing the water in the same cleaning session unless the water has been contaminated with blood/body fluids.
- Wear utility gloves when performing this cleaning and disinfection.
- Ensure all visible dirt is removed.
- Dry mops, buckets, and cleaning trolleys in a ventilated area before the next use.
- Shake the dust mops thoroughly to remove all dust before using them.

Cleaning and Disinfection of Utility/Rubber Gloves

- Utility gloves should be washed with soap and water after every cleaning session.
- Wash the gloves with soap and water before removing them. Rinse to remove soap. Remove gloves and hang to dry.
- At the end of the day, wash with soap and water and disinfect by immersion in 0.5% hypochlorite/chlorine powder solution (dilution as per manufacturer) for one minute. Rinse with plain water and hang to dry overnight.

Cleaning and Disinfection Methods for Wet Mops, Buckets and Cleaning Trolleys

	Mops(both stick and handheld)	Buckets(individual)	Cleaning trolley
Cleaning	Wash wet cleaning floor and hand held cotton mops with soap and water. Rinse to remove all soap.	Wash with soap and water using a brush. Rinse to remove all soap.	Wash the trolley bucket with soap and water using a brush. Rinse to remove all soap.
	Dry cleaning floor mops should not be washed. They should be taken to an open area and cleaned with a hand held brush.		Wipe down the trolley body with soap and water rinse wipe with water.
Disinfection	Immerse in 0.5% hypochlorite* solution/chlorine powder solution for 30 minutes. Rinse with plain water immediately to removes all residual chlorine.	Rinse with 0.5% hypochlorite solution/ chlorine powder solution for one minute. Rinse with plain water to remove all residual chlorine.	Rinse bucket with 0.5% hypochlorite solution/ chlorine powder solution for one minute.
	Microfiber mops should be washed with mild soap and disinfected with hot water (70- 80°C for two minutes). Do not use a brush to clean the mops.		Wipe down the trolley body with 0.5% hypochlorite solution. Rinse with plain water to remove all residual chlorine.

Do not use hypochlorite solution/strong soap on microfiber mops.

Storage of Cleaning Equipment

- Always store cleaning equipment in the dirty utility area of the hospital.
- Ensure the dirty utility room is clean and well-ventilated.
- Where a dirty utility room is not available, provision should be made to modify an existing area for the purpose of dirty utility. Such an area should be planned away from the patient care areas.
- Cleaning equipment should never be stored in the patient care area, placed on tables, behind doors, on windows, or in toilets.

Monitoring of cleanliness activities:

Hospitals need to ensure that they carry out the monitoring of cleanliness activities at regular intervals, preferably after each cleaning cycle, to ensure that the activities are carried out as per standard procedures of the health facility.

Hospitals need to comply with these minimum requirements for monitoring cleanliness activities:

Designated Personnel for Monitoring:

Hospitals need to designate personnel from the Infection Control Committee to carry out the activities of monitoring cleanliness. The person designated for monitoring will take daily rounds after each cleaning cycle and will also carry out surprise rounds of the hospital to ensure proper cleanliness and identify any areas for improvement in current practices. He/She will also be responsible for the supervision of housekeeping activities by counter-signing the checklists used for monitoring.

Use of Checklists:

Hospitals need to follow an evidence-based structure for monitoring cleanliness activities. Hospitals should use checklists detailing the activities carried out during the cleaning of a particular area as a standard protocol. The housekeeping personnel, after completing the activity listed in the checklist, need to sign or mark the activity, which is then monitored by the monitoring personnel and countersigned if found satisfactory. All the checklists should be displayed at relevant areas and customized to the particular area.

Monitoring of Quality of Cleaning Material

Hospitals need to ensure that the cleaning materials are prepared as per the manufacturer's recommendations and that standard apparatus or methods are used for measuring the appropriate quantity of solutions to meet the desired concentration for efficient cleaning. Suggestions/feedback need to be taken from the housekeeping staff regarding the efficiency of the cleaning agents. Monitoring of the cleaning material can also be carried out by conducting surveillance activities to assess cleaning effectiveness through microbiological testing. Routine swabbing of environmental surfaces, except in the OT, should not be done.

Drainage and sewage management

Poor sanitation increases the risk of morbidity and mortality. One of the most critical components of sanitation is the proper disposal of excreta and wastewater. Improper disposal of biodegradable waste can spread diseases and pollute the environment. Healthcare facilities should implement a well-planned drainage and sewage system to ensure the safe disposal of sewage and prevent water stagnation.

General Guidelines for Drainage and Sewage Systems:

- The drainage system should be closed, meaning no open drains within the healthcare facility premises.
- All open drains should be properly covered.
- The gradient of the drainage system should facilitate the smooth flow of water.
- Drains should be periodically checked for blockages.
- Regular cleaning (preferably once a week) should be carried out as per the healthcare facility's cleaning schedule.
- The healthcare facility's drainage and sewage system should be connected to the municipal sewage network.
- If municipal connectivity is unavailable, healthcare facilities must have an onsite sewage management system.

Guidelines for Construction of Septic Tanks (On-Site Sewage Management)

- A septic tank provides preliminary sewage treatment before final disposal. Sewage is held in these tanks for a prescribed period, allowing suspended solids to settle. The settled sludge and supernatant liquor undergo anaerobic digestion, reducing the sludge volume and organic matter content.
- Improper design, construction, or maintenance of septic tanks poses health risks. Therefore, a well-planned septic tank or onsite sewage system is essential.
- Septic tanks are typically designed for foul sewage (fecal matter and urine). Sullage waste may be dispersed by distributing it over gardens or grassed areas or drained into a seepage pit or dispersion trench for soil absorption. However, under no circumstances should effluent from a septic tank be discharged into an open channel drain or water body without adequate treatment.*
- *Management of sullage is covered separately in the "Liquid Waste Management" section of these guidelines.*

Location of Septic Tank

A septic tank should:

- Be located in an open area, as far as possible from the exterior walls of buildings.
- Not be situated in swampy or flood-prone areas.
- Be easily accessible for cleaning and maintenance.

Layout and Construction Considerations

- The layout should be as simple and direct as practicable.
- The pipes should be laid, as far as possible, in straight lines in both vertical and horizontal planes. However, where bends are unavoidable, they should be long radius bends with cleaning eyes.
- Anything that is likely to cause irregularity of flow should be avoided.
- At junctions of pipes in manholes, the direction of flow from a branch connection should not make an angle exceeding 45 degrees with the direction of flow in the main pipe.
- The floor of the tank needs to be watertight and of adequate strength to resist earth movement and support the weight of the tank, walls, and contents. The floor should be provided with a minimum slope of 1:10 towards the sludge outlet to facilitate desludging.
- The walls should be of such thickness as to provide adequate strength and watertightness. Walls built out of brick should not be less than 200 mm thick and should be plastered to a minimum thickness of 12 mm inside and outside with cement mortar. They should have a minimum thickness of 370 mm.

Note: For detailed design parameters of septic tanks, please refer to the *Indian Standard Code of Practice for Installation of Septic Tanks Part I – Design Criteria and Construction (Second Revision)*.

Commissioning of Septic Tank

- The sewerage system should be complete and ready for operation before connection is made to the building.
- The tank should be filled with water to its outlet level before the sewerage is let into the tank. It should, preferably, be seeded with small quantities of well-digested sludge obtained from septic tanks or sludge digestion tanks.
- In the absence of digested sludge, a small quantity of decaying organic matter, such as digested cow dung, may be introduced.

Sludge Withdrawal

- Half-yearly or yearly desludging of the septic tank is desirable.
- Normally, the tanks need to be cleaned when the sum of the depth of the scum and the sludge is observed to exceed half the depth of the tank.
- A portion of sludge not less than 25 mm in depth should be left behind in the tank bottom, which acts as the seeding material for the fresh deposits.
- Manual handling of sludge should be avoided.
- Spreading of sludge on the ground in the vicinity should not be allowed.

Problem Signs in Septic Tanks

The septic tank needs to be checked if there are signs that it is not working properly. Some signs of malfunction include:

- The sewage in the toilet or the liquid waste from other fixtures flows away very slowly.
- Liquid waste overflows from the disconnector trap.
- Wet areas are seen at the top of the septic tank.
- There is a strong unpleasant smell near the septic tank.
- The grass around the tank is very green and growing well.

These signs may indicate problems with the drain. Therefore, these drains will need to be checked at the same time as the septic tanks.

C. WASTE MANAGEMENT

Effective waste management helps maintain a clean environment and minimizes risks associated with improper disposal.

Health facilities must streamline and standardize all waste management activities, from generation to final disposal. This process includes collection, transportation, treatment, disposal, and ongoing monitoring and regulation. Additionally, it encompasses the legal and regulatory framework governing waste management.

These requirements are categorized into the following sections:

- Implementation of BMW Rules, 2016 & 2018 (Amendment)
- Segregation, Collection, and Transportation of BMW
- Sharp Management
- Storage of Biomedical Waste
- Disposal of Biomedical Waste
- Management of Hazardous Waste
- Solid General Waste Management
- Liquid Waste Management
- Equipment and Supplies for BMW Management
- Statutory Compliance

Implementation of biomedical waste rules, 2016 & 2018 (amendment)

- The Biomedical Waste (BMW) Management Rules were revised through a gazette notification by the Central Government in 2016 and 2018 (Amendment). It is now mandatory for all health facilities to manage the biomedical waste generated in their establishments as per these updated regulations.
- According to BMW Rules, 2016, biomedical waste is defined as any waste generated during activities related to diagnosis, treatment, or immunization of human beings, research activities, or the production and testing of biological materials in healthcare settings or health camps.
- To implement BMW Rules, 2016 & 2018 (Amendment), health facilities must be aware of the key changes compared to the BMW Rules, 1998. It is essential for each facility to keep a copy of the latest BMW Rules for reference and as a guiding document for waste management

S.No.	Category	TypeofWaste	Colour&TypeofContainer
	Yellow Category	• Human Anatomical Waste • Soiled Waste • Discarded or Expired Medicine • Chemical Liquid Waste • Chemical Laboratory Waste	Yellow colour non chlorinated plastic bags or containers  
	Red Category	Contaminated Waste (Recyclable)	Red colour non chlorinated plastic bags and containers  

	White Category	Waste Sharps including metals	White colour puncture proof, leak proof, tamper proof containers 
	Blue Category	• Glassware • Metallic Body Implants	Puncture proof and leak proof boxes or containers with blue coloured marking (2018 Amendment) 

Segregation of BMW Waste as per BMW Rules, 2016 & 2018(Amendment)

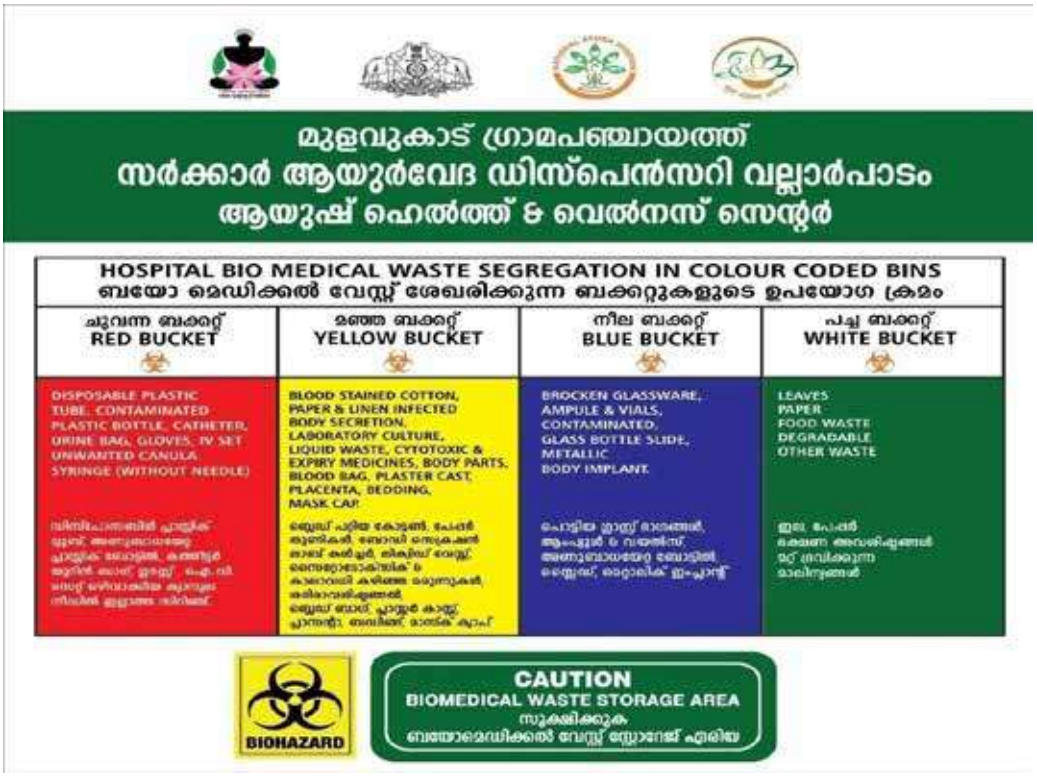
Key requirements for implementing bmw rules, 2016 & 2018 (amendment)

Health facilities must ensure the following:

- Biomedical waste is segregated according to the new color-coding scheme specified in BMW Rules, 2016 & 2018 (Amendment).
- Health facilities within a 75 km radius of a Common Biomedical Waste Treatment Facility (CBMWTF) must have a formal agreement with the CBMWTF for the final treatment and disposal of biomedical waste.
- Health facilities beyond the 75 km radius of a CBMWTF must obtain approval for a deep burial pit from the Pollution Control Board for waste disposal.
- Health facilities must pre-treat biomedical waste on-site, as per BMW Rules, before handing it over to CBMWTF or before final disposal.
- Only non-chlorinated bags (excluding blood bags) should be used for collecting waste in the healthcare facility.
- A Biomedical Waste Management Committee should be formed in each health facility to monitor waste management activities. This committee must meet at least once every six months, and all related records must be maintained.

Segregation, Collection & Transportation Of Biomedical Waste (BMW)

The key activities involved in the management of biomedical waste (BMW) in a healthcare facility include segregation at the point of generation, timely collection, and transportation. Waste should be moved from interim storage areas within the healthcare facility to the central storage area and, for facilities without an agreement with a Common Biomedical Waste Treatment Facility (CBMWTF), further transported to deep burial pits.



Segregation

General Requirements

- Healthcare organizations must ensure that waste is segregated at the point of generation.
- The responsibility for segregation lies solely with the waste generator.
- Waste from different healthcare facility areas must be segregated according to the color coding specified in the BMW Rules, 2016 & 2018 (Amendment).
- General waste must not be mixed with biomedical waste.
- Work instructions for proper segregation, as per the color coding guidelines, must be displayed at appropriate locations within the healthcare facility.

BMW Segregation area

Ayurveda Healthcare Facility-Specific Waste Management

- The major waste materials generated in an Ayurveda healthcare facility include used *kizhi* (a material used in the fomentation process) and medicated oil discarded after use. Large quantities of this oil are available, and many unscrupulous elements misuse this spent oil. An eco-friendly solution should be identified to either repurpose or safely dispose of this waste oil.
- Ayurveda healthcare facilities generate minimal waste containing blood or body parts, except in cases involving minor procedure rooms, ARC clinics, *Rakthamoksham* (bloodletting), etc., where blood-filled leeches may be classified as biomedical waste. Other biomedical waste includes items contaminated with blood and body fluids, such as dressings, plaster casts, and cotton swabs.
- Biomedical waste from Ayurveda healthcare facilities must be managed in accordance with the Biomedical Waste (Management and Handling) Rules, 2016. Waste should be segregated, collected, treated, processed, and disposed of based on the prescribed guidelines. Depending on the disposal techniques adopted, the waste is classified according to color coding.

Collection of Waste

General Requirements

- All waste collection bags must be sealed once they are filled to three-fourths (¾) of their capacity and then transported to the central waste storage area or interim storage areas.
- Waste collection must be done using closed, covered containers, preferably sturdy wheelbarrows.
- Collection times should be fixed, and the size of bins should be appropriate for the quantity of waste produced in each area of the healthcare facility.
- General waste must not be collected at the same time or in the same trolley as infectious or other hazardous wastes.
- Waste collection should be done daily, with collection times aligned to match the waste generation pattern during the day.
- The collection schedule should aim to minimize or eliminate the need for interim waste storage within departments.
- Waste handlers must wear appropriate PPE (gum boots, heavy-duty gloves, face masks, and eyewear) before handling waste.
- All waste bags must be labeled with biohazard or cytotoxic hazard symbols, along with the date and area of generation, for easy traceability.

Waste collection area

Transportation of waste

- Biomedical waste (BMW) from healthcare facilities must be transported in covered, sturdy trolleys or wheelbarrows through routes with minimal patient and visitor traffic whenever possible.

- Waste transportation trolleys must be dedicated solely for waste transport and should not be used for other purposes.
- Separate trolleys must be used for general waste and biomedical waste (BMW).
- Preferably, trolleys should follow the color coding system specified in the Biomedical Waste (Management and Handling) Rules, 2016.
- All waste transportation trolleys must be labeled with a biohazard logo.
- After each transportation cycle, trolleys must be washed, disinfected, and dried before reuse.
- The waste transportation route to the BMW holding/disposal area should be planned to:
    - Avoid high-risk areas.
    - Ensure separate routes for supplies and waste.
    - Prevent waste transportation through areas with high patient and visitor traffic.
    - Ensure easy access to the central waste collection area.
    - Facilitate safe transportation to prevent spillage or scattering of waste.

Biomedical waste transportation trolley

Storage of biomedical waste

BMW generated in the healthcare facility must be stored in a dedicated central waste storage area before being handed over to the Common Biomedical Waste Treatment Facility (CBMWTF). Healthcare facilities must ensure the following minimum requirements for the central waste storage area:

- The central waste collection station must be located away from public/visitor access.
- The storage area must include designated space for waste collection trolleys.
- The storage facility must be roofed, secured with a lock and key, and placed under the responsibility of an authorized personnel.
- The entrance should have a concrete ramp to facilitate easy movement of waste collection trolleys.
- The facility must be well-ventilated, either with exhaust fans or wire mesh windows for air circulation.
- There should be an adjacent water supply for cleaning the storage area, washing trolleys, and ensuring staff hand hygiene.
- The entrance must display a clear sign stating: **"Entry for authorized personnel only"** along with the BMW hazard logo.
- For new healthcare facilities under construction, the drainage system of the waste storage area should be connected to the Effluent Treatment System (ETS) of the facility.
- General waste must not be stored in the central waste collection area.
- The healthcare facility must ensure that biomedical waste is not stored for more than 48 hours.
- To prevent pilferage of recyclables, the central storage area must remain locked and be monitored by designated personnel.
- Healthcare facilities must maintain records of:
    - BMW handed over to the CBMWTF.
    - Recyclable waste transferred to authorized recyclers.

Ensuring Protection from Animals

To prevent stray animals from entering the healthcare facility premises, facilities must ensure that no stray animals are present within the facility, and cattle traps are installed at the entrance.

Biomedical waste storage area

Disposal of biomedical waste

Hospitals need to ensure that they have adequate arrangements for the disposal of BMW generated from the health facility. The final disposal of the BMW generated from the health facility can be taken up by the CBMWTF or through deep burial and sharp pits.

Hospitals under contract with CBMWTF

All hospital should have a valid MOU with IMAGE or any other **CBMWTF** for transportation and disposal of BMW generated from the hospital. These hospitals have to hand over the waste to the CBMWTF for final disposal and should ensure that waste is not disposed of in the deep burial and sharp pits. Hospitals need to ensure that the disposal of the BMW generated from the hospital is disposed of as per Schedule I of the BMW Rules, 2016 & 2018 (Amendment).

Disposal of Sharp

Handling of Metal Sharps

Metal sharps, including blades, scalpels, needles, burnt needles, and syringes with fixed needles, fall under the **White Category** of BMW as per the **Biomedical Waste Rules, 2016 & 2018 (Amendment).**

Sharps Handling Procedures:

- All waste-generating sites must be equipped with needle cutters or burners for cutting/burning needles and injection tips.
- Healthcare facilities must provide leak-proof, tamper-proof, and puncture-proof white translucent containers with a narrow mouth (preventing hand entry) in all waste-generating areas.
- Burnt/cut needles, blades, scalpels, and syringes with fixed needles must be stored in white translucent containers that are leak-proof, puncture-proof, and tamper-proof.
- Sharp containers must be handed over to the **CBMWTF** or disposed of in sharp pits.

Puncture proof container for collecting sharp

General Instructions for Handling Sharps:

- Do not bend, shear, break, or recap needles using both hands. Avoid removing needles from disposable syringes.
- Get assistance when handling sharps near confused or agitated patients.
- Never pass sharps hand-to-hand—use a tray or other safe transfer method.
- Do not walk around with sharps in hand—dispose of them immediately.
- Never leave sharps unattended—dispose of them yourself.
- Dispose of sharps at the point of use—carry a sharps container with you.
- Do not collect used sharps together—dispose of them immediately.
- Dispose of syringes and needles as a single unit—do not separate the needle from the syringe.
- Do not pick up broken glass with bare hands—use brushes, dustpans, tongs, or forceps.

Handling of Glassware

All glassware generated in healthcare facilities, including broken glass, medicine vials, contaminated glass, and ampules (except those containing attenuated vaccines), falls under the **Blue Category** of BMW as per the **BMW Rules, 2016 & 2018 (Amendment).** This category also includes metallic caps of bottles and other metal waste used in healthcare facilities.

Glassware Handling Steps:

- Pre-treat all glassware waste in the healthcare facility before handing it over to the CBMWTF or disposing of it in sharp pits.
- Pre-treatment involves immersing the waste in a 1% chlorine solution (containing 30% residual chlorine) for at least 20 minutes or autoclaving as per Schedule II of the **BMW Rules, 2016 & 2018 (Amendment).** *(Note: Hypochlorite solution must be freshly prepared before use.)*
- Glassware must be collected and stored in puncture-proof, leak-proof boxes or containers with blue markings (as per the 2018 Amendment).
- These containers must be handed over to the CBMWTF for final treatment and disposal.

ആശുപത്രി മാലിന്യം വേർതിരിക്കുന്ന ചാർട്ട്
HOSPITAL WASTE SEGREGATION CHART

ബിൻ	മാലിന്യത്തിന്റെ തരം	
മഞ്ഞ YELLOW	മനുഷ്യ ശരീര ഭാഗങ്ങൾ	Human anatomical waste
	മൃഗങ്ങളുടെ ശരീര ഭാഗങ്ങൾ	Animal anatomical waste
	രക്തവും ശരീര ദ്രവവും കൊണ്ട് മലിനമായ വസ്തുക്കൾ	Soiled waste-items contaminated with blood and body fluids
	ഡ്രെസ്സിംഗുകൾ, പ്ലാസ്റ്റർ, കോട്ടൺ	Dressings, Plaster casts, cotton
	ബ്ലഡ് ബാഗുകൾ	Blood Bags
	ഉപേക്ഷിച്ച മെത്തകൾ, കിടക്കകൾ	Discarded linen Bed
	മാസ്ക്, ക്യാപ്	Face masks, caps
	കാലഹരണപ്പെട്ടതോ, ഉപേക്ഷിച്ചതോ ആയ മരുന്നുകൾ	Expired or Discarded Medicines Chemical Waste
	ഉപേക്ഷിക്കപ്പെട്ട റീ ഏജന്റുകൾ	Discarded reagents
	അണുനാശിനികൾ	Disinfectants
	രാസ ദ്രാവക മാലിന്യങ്ങൾ	Chemical Liquid Waste
	ക്ലിനിക്കൽ ലാബ് വേസ്റ്റ്	Clinical Lab waste
ചുവപ്പ് RED	സിറിഞ്ചുകൾ (സൂചി ഇല്ലാത്തത്)	Syringes (without needles)
	കയ്യുറകൾ	Gloves
	IV കുപ്പികൾ, IV സെറ്റ്	IV Bottles (NS DNS RL), IV set
	കത്തീറ്റർ, യൂറിൻ, ബാഗ്	Catheters,Urine bags, Drains
നീല BLUE	എല്ലാ ഗ്ലാസ് മാലിന്യങ്ങളും	All Glass waste
	പൊട്ടിയ ഗ്ലാസ്	Broken/discarded glass
	കുപ്പികൾ, ആംപ്യൂളുകൾ	Vials, ampules
	ലാബ് സ്ലൈഡുകൾ	LAB slides
	ലോഹങ്ങൾ, ആണികൾ, കത്രിക	Metals - Nails, Scissors
വെള്ള WHITE	സൂചികൾ	Needles
	സൂചികൾ ഉള്ള സിറിഞ്ചുകൾ	Syringes with fixed needles
	സ്കാൽപെലുകൾ, ബ്ലേഡുകൾ	Scalpels, Blades
	മൂർച്ചയുള്ള ലോഹങ്ങൾ	Waste sharp metals

ഗവ. ആയുർവേദ ഡിസ്പെൻസറി തുരുത്തിക്കര
Govt. AYURVEDA DISPENSARY, THURUTHIKKARA

Sharp Waste Management

Proper management of sharp waste is crucial to prevent injuries and exposure to blood-borne pathogens.

Sharp Waste Includes:

- Needles, syringes, scalpels, blades, broken glass, and metal objects that can cause punctures or cuts.
- Both used and unused sharps.

Risk Prevention Measures:

- Safe handling and disposal of sharps must be part of the healthcare facility's infection control strategy.
- Proper disposal methods protect staff, patients, and visitors from exposure to blood-borne infections.

Post exposure prophylaxis (PEP)

In the health facility, all healthcare personnel are at risk of exposure to blood-borne pathogens. For the management of any exposure to blood-borne pathogens, it must be ensured by the health facilities that there is a protocol in place for reporting such exposure and providing appropriate post-exposure prophylaxis to the exposed staff.

Post-exposure prophylaxis (PEP) refers to the comprehensive management given to minimize the risk following exposure to blood-borne pathogens (HIV, HBV, and HCV). This includes:

- First aid
- Counselling
- Risk assessment
- Relevant laboratory investigations based on informed consent of the source and exposed person
- Depending on the risk assessment, the provision of short-term (4 weeks) antiretroviral drugs or hepatitis immunoglobulin and vaccine
- Follow-up and support

Exposure that may place a healthcare worker at risk of blood-borne pathogens is defined as:

- 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)
- 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	
Exposure to body fluids considered at "risk"	**Exposure to body fluids considered "not at risk"***
• Blood • Semen • Vaginal secretions • Cerebrospinal fluids • Synovial, pleural, peritoneal, pericardial fluid • Amniotic fluid • Other body fluids contaminated with visible blood	• Tears • Saliva • Urine and faeces • Sweat ****All these fluids are considered to be non-infectious only if these secretions are not contaminated with visible blood***

Steps For Managing Accidental Exposure
STEP 1: Managing The Exposure Site
For Skin

- If the skin is broken due to a needle-stick injury or sharp instrument, immediately wash the wound and surrounding skin with water and soap, then rinse.
- Do not scrub the wound.
- Do not use antiseptics or skin washes (e.g., bleach, chlorine, alcohol, betadine).

After a Splash of Blood or Body Fluids

For Unbroken Skin:

- Wash the area immediately.
- Do not use antiseptics.
- Do not squeeze the injured site to cause bleeding.

For the Eye:

- Irrigate the exposed eye immediately with water or normal saline.
- Sit in a chair, tilt your head back, and ask a colleague to gently pour water or normal saline over the eye.
- If wearing contact lenses, leave them in place while irrigating, as they act as a barrier and help protect the eye.
- Once the eye is cleaned, remove the contact lenses and clean them normally before reuse.
- Do not use soap or disinfectant on the eye.

For the Mouth:

- Spit out the fluid immediately.
- Rinse the mouth thoroughly with water or saline and spit again. Repeat several times.
- Do not use soap or disinfectant in the mouth.
- Consult the designated physician at the institution for further management.

Summary of Do's and Don'ts for Accidental Exposure

Summary of "Dos" and "Don'ts" For Accidental Exposure	
• Remove gloves, if appropriate • Wash the exposed site thoroughly with running water • Irrigate with water or saline if eyes or mouth have been exposed • Wash the skin with soap and water	• **Do not** panic • **Do not** put the pricked finger in mouth • **Do not** squeeze the wound to bleed it • **Do not** use bleach, chlorine, alcohol, betadine, iodine or other antiseptics/detergents on the wound

STEP 2: Establishing eligibility for PEP

A designated doctor at the health facility should assess the risk of HIV or HBV transmission after accidental exposure. This evaluation should be conducted as quickly as possible, ideally within two hours but certainly within 24 hours. Not every accidental exposure requires prophylactic treatment, so a thorough risk assessment is necessary.

Administration of PEP

- The first dose of PEP should be administered:
- Within a few hours for HIV exposure
- Within 24 hours for Hepatitis B exposure.
- PEP taken after 72 hours may be less effective; hence, risk evaluation must be done immediately.
- If the risk is insignificant, PEP may be discontinued (if already started).
- If the risk is significant, the exposed person should be referred to higher centers with PEP facilities.

Two Main Factors Determine the Risk of Infection

1. The nature of exposure.
2. The status of the source patient.

Assessing the Nature and Risk of Exposure

Mild Exposure (Mucous Membrane/Non-Intact Skin with Small Volumes)

- Superficial wound (erosion of the epidermis) caused by a plain or low-caliber needle.
- Contact with eyes or mucous membranes.
- Subcutaneous injection with a small-bore needle.

Moderate Exposure (Mucous Membrane/Non-Intact Skin with Large Volumes OR Percutaneous Superficial Exposure with Solid Needle)

- A cut or needle-stick injury penetrating gloves.

Severe Exposure (Percutaneous with Large Volume)

- An accident involving a high-caliber needle (>18G) visibly contaminated with blood.
- A deep wound (hemorrhagic and/or very painful).
- Transmission of a significant volume of blood.
- Injury from material previously used intravenously or intra-arterially.

Assessing the HIV Status of the Source

- PEP must be started as soon as possible (within hours) after exposure and no later than 72 hours.
- PEP is ineffective beyond 72 hours post-exposure.
- Baseline rapid HIV testing of the source patient should be conducted before starting PEP.
- If HIV testing results are delayed, PEP should not be delayed if indicated.
- Informed consent must be obtained before testing the source patient, as per national HIV testing guidelines.

Categories of Situations Depending on the Results of the Source	
Source HIV status	**Definition of risk in source**
HIV Negative	Source is not HIV infected but consider HBV and HCV
Low Risk	HIV positive and clinically asymptomatic
High Risk	HIV positive and clinically symptomatic
Unknown	Status of the patient is unknown and neither the patient nor his/ her blood sample is available for testing (e.g. injury during the BMW handling the source of the patient might be unknown. The risk assessment will be based only on the exposure.

Assessment of Exposed Individual

- The exposed individual must receive confidential counseling and assessment by an experienced physician.

- They should be evaluated for pre-existing HIV infection, ensuring that PEP is intended for individuals who are HIV-negative at the time of potential exposure.
- Exposed individuals who are known or found to be HIV-positive should not receive PEP. Instead, they should be offered counseling, provided with information on transmission prevention, and referred for clinical and laboratory assessment to determine eligibility for antiretroviral therapy (ART).

Step 3: Counsel for PEP

- Exposed individuals should receive comprehensive information about PEP, including its risks and benefits, to ensure informed consent.
- PEP is not mandatory. However, if an exposed individual refuses PEP, this should be documented.
- Psychological support should be provided, as many individuals experience anxiety after exposure. They should be informed about potential risks and available measures to alleviate concerns. Specialized psychological support should be provided if necessary.
- Counseling should include an explanation of the signs and symptoms of HIV/HBV and guidance on when to seek medical assistance.
- Proper documentation is essential.

Step 4: Prescribe PEP

- PEP should be initiated as soon as possible, preferably within two hours of HIV exposure and within 24 hours in the case of Hepatitis B exposure.
- The PEP regimen should be determined based on the type of exposure and the HIV/Hepatitis B vaccination status of the source individual.
- Testing of the source patient should not delay the initiation of PEP.
- PEP should be started immediately, and the patient can be referred for further consultation if required.
- In cases of high-risk exposure from a source patient exposed to or taking antiretroviral medications, consult an expert to determine the PEP regimen, as the risk of drug resistance is high.
- Expert consultation should be sought if the exposed healthcare worker is a pregnant female.
- For details on the PEP regimen, side effects, medication dosage, and PEP guidelines when the source is on ART, refer to the NACO Guidelines on PEP.

Step 5: Laboratory Evaluation

- PEP should not be delayed if HIV/HBV testing facilities are unavailable.
- HIV/HBV testing is required immediately after occupational exposure to establish a baseline for comparison with future test results.
- If the exposed person tests HIV/HBV-negative at baseline, subsequent infection detected through follow-up testing can be assessed for its relation to occupational exposure.
- Exposed individuals should receive standard pre-test counseling per national HIV testing and counseling guidelines, with informed consent for testing.
- Confidentiality of test results must be ensured.

Step 6: Follow-Up of an Exposed Person

- Follow-up is necessary to monitor for potential infections and provide psychological support, regardless of whether PEP was initiated.
- Individuals exposed to HIV should have a repeat evaluation three days after exposure in addition to the initial assessment.
- Follow-up must include both clinical evaluation for signs and symptoms of HIV/HBV seroconversion and laboratory testing for post-PEP HIV/HBV status.
- For detailed follow-up procedures and prophylaxis drug recommendations, refer to the NACO Guidelines on PEP.

Reporting of Needle Stick Injuries

- All needle stick injuries and exposures must be reported to the appropriate healthcare facility authority in a standardized format.
- Healthcare facility staff should be informed about the reporting procedure.
- Records related to needle stick injuries, PEP administration, and follow-up must be maintained.
- Refer to Annexure VI: "Needle Stick Injury Reporting Format."

Management of hazardous waste

Management of Mercury Waste

Mercury exists in three forms: elemental, inorganic, and organic. Elemental mercury vapors are colorless, odorless, and highly toxic when inhaled. Mercury is a potent neurotoxin that persists in the environment for a long time and is extremely toxic even in small amounts. Exposure to mercury affects the central and peripheral nervous systems and can damage the brain, spinal cord, kidneys, eyes, and liver. Additionally, mercury can easily cross the placenta, passing from mother to the unborn child, impacting fetal neurological development.

In healthcare facilities (HCFs), exposure to mercury can occur through inhalation, ingestion, or skin contact, varying according to the metal speciation. Mercury can be released into the environment in several ways, including spillage, burning of medical waste containing mercury, or improper disposal of mercury-based residual dental amalgams without pre-treatment. The primary cause of mercury release in healthcare facilities is spillage, often due to the breakage of instruments and equipment containing mercury, such as thermometers, sphygmomanometers,

The possible areas of mercury exposure in health facilities include:

- Laboratories
- Outpatient Clinics
- Pharmacy
- Stores and Wards

Hospitals must ensure that any mercury spill is safely managed to protect the environment and staff from the adverse effects of mercury exposure.

Spillage management:

Precautions during Mercury Spillage

- Evacuate patients, staff, and visitors from the affected area.
- Turn off heaters and air conditioners to minimize mercury volatilization.
- Ensure proper ventilation by opening windows and vents while closing ventilation systems that could spread mercury vapors.
- Do not use vacuum cleaners or brooms to clean mercury spills.
- Avoid handling mercury spills with bare hands; use appropriate personal protective equipment (PPE) such as rubber gloves, goggles, face shields, and protective clothing.
- Remove jewelry before handling mercury, as it binds with metals.
- Never discharge mercury spills into drains or sewers.
- For spills larger than 3 grams, collect mercury at temperatures below 25°C to reduce volatilization.
- Large mercury spills must be reported to the State Pollution Control Board (SPCB) or Central Pollution Control Board (CPCB).

Mercury spill kit

'Mercury Spill Kits' are essential for the management of mercury spills. Mercury spillage collection kits should be kept at all suitable places in healthcare facilities (HCFs) to allow rapid access in the event of mercury spillages. All staff, especially housekeeping staff, should be trained in Mercury Spill Kit management to prevent further exposures. The Mercury Spill Kit should be maintained in marked boxes or portable containers.

The components of the Mercury Spill Kit are as follows:

1. Personal Protective Equipment (PPE)

- Rubber or nitrile gloves
- Safety goggles or protective eyewear
- Respiratory protection, face mask (designed particularly for mercury) or, if no specialty masks are available, a face mask with a 0.3-micron HEPA filter
- Coveralls, apron, and other protective clothing
- Disposable shoe covers

2. Collection and Containment Materials

- Air-tight, sealable plastic bags (small and large sizes, thickness 40 to 150 microns)
- Small, air-tight, rigid plastic container or glass bottle, half-filled with water or a vapor suppression agent for collecting elemental mercury
- Air-tight, puncture-resistant, rigid plastic or steel jar/glass or container with a wide opening for collecting mercury-contaminated broken glass

- Plastic tray

3. Tools Required for Removing Mercury

- Flashlight (electric torch) to locate shiny mercury beads
- Plastic-coated playing cards or thin pieces of plastic to push mercury beads into a plastic scoop or pan; if these are not available, use index cards, pieces of cardboard, or stiff paper
- Small plastic scoop or plastic dustpan/ X-ray film to catch the mercury beads
- Tweezers to remove small broken glass pieces
- Eyedropper or syringe (without needle) to draw up large mercury beads
- Duct tape or sticky tape to pick up tiny mercury droplets

4. Vapor Suppression Agents

- Sulfur powder (available from pharmacies) to absorb mercury by forming mercuric sulfide (or zinc/copper flakes to absorb mercury by forming amalgams)
- Commercial absorbent pads or vapor suppressants containing a foam pad saturated with a suspension of sodium thiosulfate, copper sulfate, calcium chloride, and potassium iodide
- Small quantities of a propylene glycol solution, sodium thiosulfate, or copper sulfate may also be used as vapor suppression agents

5. Additional Tools and Materials

- Brush to remove powder or flakes
- Utility knife blade

6. Materials for Decontamination

- Vinegar, hydrogen peroxide, and cotton swabs for final cleaning when using sulfur powder
- Decontaminant solution or commercial decontaminant (made of 10% sodium thiosulfate solution or a mixture of sodium thiosulfate and EDTA)

Whenever a spill kit is used, the staff involved in the cleanup should ensure that the contents are replenished as soon as possible.

Suggested Steps For Mercury Spill Clean-Up

1. **Evacuate Area**
   As far as possible, keep people who are not involved in the clean-up away from the spill area to limit exposure and prevent the spread of contamination.
2. **Put on Face Mask**
   To prevent breathing in mercury vapors, wear a protective face mask as suggested in the spill kit.
3. **Remove Jewellery**
   Remove all jewellery from hands and wrists to prevent mercury from combining (amalgamating) with precious metals.
4. **Wear Gloves**
   Put on rubber or latex gloves. If there are any broken pieces of glass or sharp objects, pick them up carefully. Place all broken objects on a paper towel, fold the towel, and place it in a puncture-proof plastic bag or a container with a lid. Secure and label it as containing items contaminated with mercury.
5. **Locate Mercury Beads**
   Identify all mercury beads and check for any in surface cracks or hard-to-reach areas. Inspect a wide area beyond the spill. Use a flashlight to locate additional glistening mercury beads that may be sticking to the surface or small cracks. Cardboard sheets should be used to push the spilled beads of mercury together.
6. **Use Syringe Without Needle/Eyedropper and Sticky Tape**
   A syringe (without a needle) should be used to suck up mercury beads. Collected mercury should be placed slowly and carefully into an unbreakable plastic container or glass bottle with an airtight lid, half-filled with water. After removing larger beads, use sticky tape to collect smaller, hard-to-see beads. Place the sticky tape in a puncture-proof plastic bag and secure it properly.

Commercially available powdered sulphur or zinc stains

- ✓ Make mercury a darker colour, which makes smaller beads easier to see. Powdered sulphur may be used because:
  - ✓ It makes the mercury easier to see since there may be a colour change from yellow to brown, and
  - ✓ It binds the mercury so that it can be easily removed and suppresses the vaporisation of any missing mercury.

Collection in Leak-proof Bag or Container

Place all the materials used during the clean-up, including gloves and mercury spills collected from the spill area, into a leak-proof plastic bag or container with a lid. Seal it properly and label it as per guidelines. Such collected waste should be stored in a designated area only.

Cleaning of Floor and Room Surfaces Contaminated with Mercury

Sprinkle sulphur or zinc powder over the area, which will quickly bind any remaining mercury. If zinc powder is used, moisten it with water after sprinkling and use a paper towel to rub it into cracks in the flooring. Use cardboard and then dampened paper towels to pick up the powder and bound mercury. Place all towels and cardboard in a plastic bag, seal all the bags used, and store them in a designated area.

All mercury spill surfaces should be decontaminated with a **10% sodium thiosulfate solution**. Keep a window open to ventilate the area after clean-up. Once all the mercury has been removed, resume normal vacuuming and use the cleaned area for routine operations.

Labelling

All bags or containers containing items contaminated with mercury should be **properly marked and labelled** with the following details:

- "Hazardous Waste, Handle with Care"
- Date of storage/generation
- Name and address of the hospital along with the contact number

Storage

The following points should be considered for the storage of mercury-bearing waste within healthcare facilities (HCFs):

- The storage area should be away from heat-generating equipment.
- The storage room should have a **Mercury Spill Kit**, proper ventilation (preferably with an exhaust fan), smooth tiled flooring with an adequate slope, and proper lighting arrangements.

Disposal

Collected mercury waste should be handed over to the **Common Biomedical Waste Treatment Facility (CBMWTF)** or the **identified agency of the Central Pollution Control Board (CPCB).**

Mercury spillage kit

Spill Management of Blood And Body Fluids

Small Volumes of Spill (Few Drops):

- Wear workman's gloves and other PPE appropriate to the task.
- When sharps are involved, use forceps to pick up sharps and discard these items in a puncture-resistant container.
- Wipe the spill with newspaper moistened with a hypochlorite solution (1% dilution containing a minimum of 500 ppm chlorine). Discard the paper as infected waste.

- Repeat until all visible soiling is removed.
- Wipe the area with a cloth mop moistened with 1% hypochlorite solution and allow it to dry naturally.
- All contaminated items used in the clean-up should be placed in a bio-hazardous bag for disposal.

Large Spills (>10ml):

- Confine the contaminated area.
- Wear workman's gloves and other PPE appropriate to the task.
- Cover the spill with newspaper or appropriate absorbent material to prevent it from spreading.
- Flood the spill with a 10% hypochlorite solution. While flooding the spill with a 10% hypochlorite solution, ensure that both the spill and absorbent material are thoroughly wet.
- Alternatively, chlorine granules can be sprinkled on the spill first, and then the paper put over it.
- Wait for five minutes.
- Remove and discard the paper as infected waste.
- Wipe the area with paper moistened with 10% hypochlorite again if required until all visible soiling is cleaned.
- Wipe the area once with 10% hypochlorite and a cloth mop, then allow it to dry naturally.
- All contaminated items used in the clean-up should be placed in a bio-hazardous bag for disposal.

SPILL KIT

Blood and Body Fluid Spill Kit Contents:

- Workman's gloves (x2 pairs)
- Apron
- Mask
- Shoe cover or plastic bag to cover the shoes
- Absorbent material like newspaper or blotting paper
- Waste collection bag

Cleaning equipment – bucket, mop, cloths, and hypochlorite solution – can be obtained from housekeeping and must be washed and disinfected appropriately after use.

If chlorine solution is not prepared fresh daily, it can be stored at room temperature for up to 30 days in a capped, opaque plastic bottle, with a 50% reduction in chlorine concentration after 30 days of storage (e.g., 1000 ppm chlorine [approximately a 1:50 dilution] at day 0 decreases to 500 ppm chlorine by day 30).

Spill Kit Availability

All the spill kits must be readily available in all departments, especially where the risk of spill is higher, such as laboratories, sample collection rooms, and wards. The spill kit must be immediately replenished after use and stored at its original location after every use.

Display of Spill Management Protocols

Spill management protocols need to be displayed at prominent locations in the hospital. Displayed protocols serve as a ready reference for the staff for the management of spills.

Training of Staff on Spill Management

All hospital staff must be trained in spill management protocols. Training should include mock drills for spill management and chemical spill management.

Blood spillage kit

Management of Radioactive Waste

For all hospitals using radioactive isotopes for diagnostic and therapeutic applications, safe disposal of radioactive waste is a vital component of overall hospital waste management. An important objective in radioactive waste management is to ensure that radiation exposure to individuals (public, radiation workers, and patients) and the environment does not exceed prescribed safe limits. Disposal of radioactive waste in the public domain is undertaken in accordance with the *Atomic Energy (Safe Disposal of Radioactive Waste) Rules, 1987*, promulgated under the *Indian Central Government Atomic Energy Act, 1962*. Hospitals that envisage the use of radioactive isotopes must ensure that structural and functional parameters are met to keep environmental radiation levels and personal radiation exposure of workers and the public within permissible limits.

Hospitals need to appoint a **Radiation Safety Officer (RSO)** as per **AERB** guidelines for monitoring the disposal of radioactive waste in the facility. Hospitals that do not use radioactive isotopes need to ensure the following:

- The **radiographic developer** used in processing X-ray films in the radiology department is not discharged into the municipal drain.
- The **silver X-ray film developing fluid** is an income source for the hospital and can be sent to authorized recyclers for resource recovery.
- The **radiological waste** generated due to the decommissioning or condemnation of X-ray machines, OPG, or C-Arms must be handled as per the *Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987*.

Management of Disinfectants and Lab Reagents

- All **disinfectants and laboratory reagents** must be disposed of per manufacturer guidelines.
- Direct disposal of disinfectants and reagents into **municipal drains** should be strictly avoided.
- This document provides comprehensive guidelines for handling exposure incidents, hazardous waste, and infection control in healthcare facilities. Healthcare facilities must ensure strict adherence to these protocols to enhance safety and compliance.
- All **waste must be pre-treated** in the facility per the manufacturer's instructions before disposal into municipal drains.
- **Neutralization of chemicals** should be done before disposal.

Chemical Spill Management

Spill Prevention

Chemical spills can be prevented in the workplace by:

- Ensuring appropriate chemical containers with good-condition seals (e.g., glass containers for corrosive chemicals).
- Storing all chemicals appropriately.
- Providing locked cupboards and storage areas.
- Using drip trays or purpose-built chemical storage cupboards/cabinets with inbuilt spill retention.
- Storing chemicals as per their respective Material Safety Data Sheets (MSDSs).
- Ensuring appropriate equipment and procedures for chemical spill management.

- Reviewing and maintaining relevant MSDSs to ensure proper risk controls for accidental spills. MSDSs should not be older than five years from the date of issue.

Chemical Spill Kit

Spill kits must be provided and readily accessible in relevant locations within the hospital. A chemical spill kit should include the following items:

Absorbents:

- **Universal Spill Absorbent:** 1:1:1 mixture of Flor-Dri (or unscented kitty litter), sodium bicarbonate, and sand. This all-purpose absorbent is suitable for most chemical spills, except hydrofluoric acid.
- **Absorbent Pads and Rolls:** 'HazMat' absorbent pads.
- **Acid Spill Neutraliser:** Sodium bicarbonate, sodium carbonate, or calcium carbonate.
- **Alkali (Base) Neutraliser:** Sodium bisulfate, boric acid, or oxalic acid.
- **Solvent/Organic Liquid Absorbent:** Inert absorbents such as clay and sand.

Personal Protective Equipment (PPE):

- **Hand Protection:** Chemical-resistant safety gloves (e.g., nitrile gloves).
- **Eye Protection:** Safety goggles.
- **Body Protection:** Laboratory coat/corrosive apron.
- **Foot Protection:** Enclosed footwear, shoe covers.
- **Respiratory Protection:** Dust mask/respirator (All personnel should be properly fit-tested before using a respirator).

Clean-up Material:

Clean-up materials for spills can be obtained from housekeeping and should include:

- Brooms, plastic dustpan, and square-mouth shovel to sweep up the absorbent material.
- Paper towels for minor spills.
- Plastic tongs/scoops to pick up contaminated absorbent material.
- A chemical-resistant bin with a close-fitting lid to contain the spill volume and absorbent residues before disposal.
- Heavy-duty plastic bags for wrapping contaminated PPE.

Spill Response

Step 1: Assess Safety and Stop the Source of the Spill

- Limit access to the spill area and ensure only trained personnel with appropriate equipment handle the spill.
- If necessary, right the overturned container or place the leaking source in a larger container to contain the spill.

Step 2: Review Safety Precautions and Risk Controls

- Check the relevant MSDS for the spilled chemical (MSDS should be available where chemicals are used and stored).
- Follow the MSDS instructions for handling spills and first aid measures.

Step 3: Clean up the Spill

- Using appropriate PPE, promptly cover the spill with absorbent material, ensuring not to spread the spill further.
- Use a dustpan to collect the absorbent material/waste and place it into a thick-walled, puncture-proof chemical-resistant bag/bin, which should be suitably labeled.

Step 4: Notify the Appropriate Authority

- Report any dangerous chemical spills to the appropriate authority.

Step 5: Restock the Chemical Spill Kit

- Replenish the spill kit and return it to its designated storage location.

Note: Chemicals must be treated as per the manufacturer's instructions before being disposed of into the municipal drainage system.

Chemical Spill Management

Neutralising Acid Spills

Acid spills can be neutralised with sodium bicarbonate, sodium carbonate, or calcium carbonate.

Process:

- Contain the liquid first.
- Sprinkle powder over the spill slowly, starting from the outside.
- Acid is neutralised if effervescence ceases in the presence of excess bicarbonate.

- Avoid breathing in the fine powder and the gas evolved (carbon dioxide).

Neutralising Alkali Spills

Alkali spills can be neutralised with sodium bisulphite, boric acid, or oxalic acid. Many alkalis can result in serious burns to the skin and eyes, so extreme caution is necessary.

Process:

- Ensure adequate ventilation.
- Eliminate all sources of ignition, as neutralisation of alkali can produce heat. This includes removing all combustible materials near the spill.
- Right any overturned containers where the spill originated or stop the leak at the source only if safe to do so.
- Avoid handling fluid even with nitrile gloves.
- Liberally apply the alkali neutraliser around the perimeter of the spill to limit spreading and continue sprinkling it toward the centre until the entire spill is covered and no free liquid remains. The neutralisation reaction should occur within 1-5 minutes after application.
- Stand clear as splattering of reaction products might occur. The heat and vigour of the reaction depend on the type and concentration of the alkali being neutralised.
- The alkali is neutralised when the reaction has stopped and no more fizzing occurs.

Caution:

- Neutralised alkalis may produce heat. Wait until mixtures have cooled before sweeping up the spilled material.
- Avoid handling spilled material until absorption is complete.
- Use non-metal, non-sparking tools such as a broom, scoop, or scraper to clean up the neutralised spill. Take care not to overly disturb the neutralised spill.

Solid Spills

Process:

- Sweep solid material into a plastic dustpan and place it in a sealed container. Minimise dust formation to prevent the contaminated powder from becoming airborne.
- The use of a dust mask is advisable.
- Wipe the area with a wet paper towel and dispose of the used paper towel in a strong polyethylene bag. Seal the bag and ensure all waste is collected for proper disposal.

Liquid Spills (Other than Flammable Liquids) Process

- Spread absorbent pads over the spill, starting with the edges first. This will help contain the spill to a smaller area. Enough pads should be used to completely cover the liquid.
- Pick up the contaminated pads with tongs or a scoop and place them into a chemical-resistant bin.
- If the chemical is water-soluble, wipe the area down with a paper towel, followed by a wet mop and detergent.
- Appropriately dispose of the used paper towel.

Flammable Liquid Spills Process

- Control all sources of ignition—turn off all electrical and heat-generating equipment.
- Spread the absorbent pads over the spill, starting from the edge. Allow the pads to completely soak up the liquid.
- Pick up the contaminated pads with tongs or a scoop to minimize direct contact.
- Place the waste into a chemical-resistant bin.
- Wipe the area down with a paper towel and copious amounts of water.
- Dispose of the paper towel into a chemical-resistant bin and seal the bin so it is airtight.
- **Never** use a wet vacuum cleaner on flammable solvents.

Oil Spills management:

- For oil spills the area is sealed first and soaked with dry cloth, later it is cleaned & wet mopped with soap solution and water, ensuring that the slipperiness in the surface has been removed.

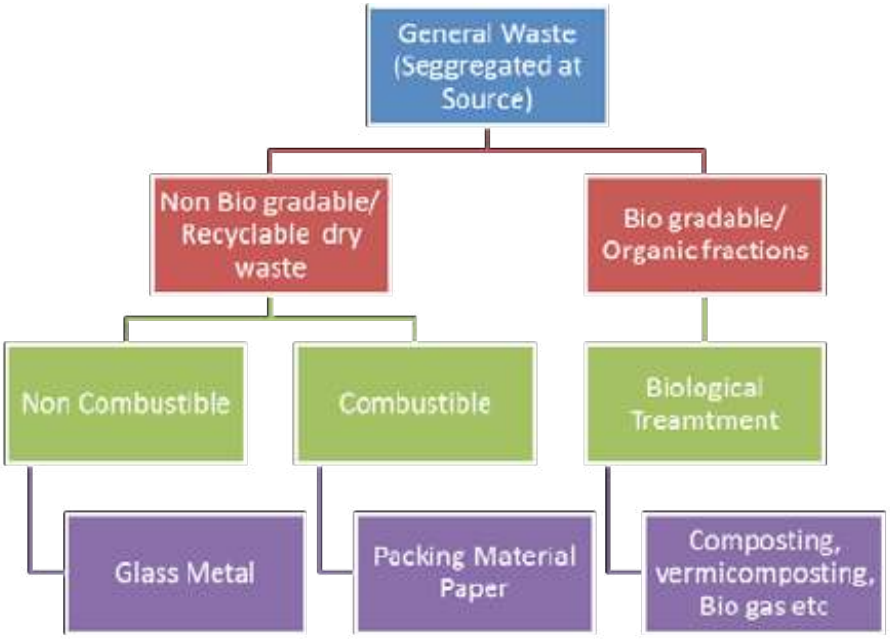
Solid General Waste Management

Healthcare facilities must ensure that solid general waste is managed according to the Solid Waste Management Rules, 2016.

Classification of Solid General Waste

Solid general waste generated in healthcare facilities is categorized into:

1. **Bio-Degradable Waste**
    - Organic material that can be broken down by microorganisms into simpler stable compounds.
    - **Examples:** Paper waste, food waste, kitchen waste, medicine preparation waste, raw material waste, discarded medicines, and used powders.
2. **Non-Biodegradable Waste**
    - Waste that cannot be degraded into simpler stable compounds by microorganisms.
    - Further classified into:
        - **Recyclable Waste:** Plastic bottles, aluminum cans, diapers, etc.
        - **Combustible and Non-Combustible Waste**



General Requirements for Solid Waste Management

- Healthcare facilities must have two types of bins for collecting bio-degradable and recyclable waste.
- Bins should be placed at waste collection points and in the central storage area.
- Healthcare facilities should educate visitors and patients on waste segregation through posters at collection points.
- All staff members should be trained on proper waste segregation.
- The Infection Control Committee should ensure that solid general waste is properly segregated and not mixed with Biomedical Waste (BMW).
- The waste should be handed over to the municipal committee and corporations for disposal.
- If municipal waste collection is unavailable, healthcare facilities must dispose of waste in a compost pit within the premises.
- Healthcare facilities should adopt innovative practices like vermin composting and waste-to-energy conversion.

3. Construction of Compost Pits

Steps for Compost Pit Construction

- A two-tank system for garden and general waste is recommended.
- A 1m x 1m x 1m tank is constructed above ground, preferably under a shade.
- The tank is divided vertically into two equal halves with vented partitions.
- Twigs and small branches are placed at the base.
- Waste is deposited over this layer and spread evenly.
- Every 15-20 cm layer of waste should be covered with a thin layer of soil.
- Water should be sprinkled over the layers.
- Once the tank is ¾ full, the second tank should be used.
- The first tank's contents should be left for two months before using the compost as manure

4. Vermicomposting

In this method, a few species of earthworms (*Eudrilus eugeniae*, *Eisenia foetida*, and *Perionyx excavatus*) are added to the compost. These help to break the waste, and the added excreta of the worms make the compost very rich in nutrients.

Steps for Vermicomposting:

- A covered or selected site is chosen for the compost pit.
- Preferably, the pit should be lined with granite or brick to prevent nitrite pollution of the subsoil water.
- Each time organic matter is added to the pit, it should be covered with a layer of dried leaves or a thin layer of soil, allowing air to enter the pit.
- Usually, after 6 to 8 weeks, rich pure organic matter is ready for use.

Liquid Waste Management

The practice of pouring biomedical liquid waste directly into the municipal drainage without proper pre-treatment poses a risk of spreading infections to staff, patients, and the community. This is due to the potency of liquid waste, which is susceptible to spilling, splashing, aerosolizing, and absorbing into the land.

To minimize or eliminate this risk, hospitals must ensure that all liquid waste generated from healthcare facilities is managed properly. This will ensure that liquid waste does not pose any risks or adversely affect the environment, healthcare workers, or the community.

Liquid Waste in the Hospital

Hospitals generate liquid waste from various departments, including:

- Discarded samples
- Blood
- Body fluids and aspirated fluids
- Liquid discharge from laboratories
- Chemical waste such as disinfectants and cleaning materials
- Infected secretions
- Housekeeping materials

Disinfection and Treatment Of Liquid Waste

Infectious liquid waste generated from the hospital, such as blood, body fluids, secretions, and discarded samples, needs to be disinfected using a 1%-2% hypochlorite solution with a minimum contact time of 30 minutes before final disposal.Housekeeping materials used in the hospital should be diluted with an ample amount of water before discharging them into municipal drains. Disinfectants and laboratory reagents used in the hospital must be treated and disposed of as per the manufacturer’s guidelines. All liquid waste generated from the hospital should be appropriately treated in-house before being disposed of into municipal drains. It is recommended that District Hospital-level facilities treat the liquid waste through a dedicated Effluent Treatment System if sewage treatment facilities are not provided by municipal agencies.For smaller facilities such as AHWC/Dispensaries, onsite disinfection of liquid waste can be done through a local Liquid Waste Disinfection setup.


Liquid waste treatment system

Management of oil-water mixtures

Proper Disposal of Oil-Water Waste

- Follow local waste disposal guidelines.
- Do not pour oil-water mixtures down the drain (to prevent plumbing blockages).
- Use absorbent materials (cat litter, sawdust, paper towels) for small amounts of oil before disposal.
- Separate oil from water, where possible. Oil can be:
- Used in incinerators.
- Reused in manufacturing (e.g., grease production, interlocking tile manufacturing)
- Burned along with other solid waste.
- The remaining water should be sent to an effluent treatment plant for reuse in:
- Agriculture Landscape irrigation
- Toilet flushing
- Dust control and construction activities for large quantities, contact a hazardous waste facility for proper disposal.

Management of sullage

Sullage, i.e., liquid waste generated from sanitation, bathrooms, and kitchens that does not contain urine or excreta, needs to be scientifically managed by the healthcare facility. The plumbing and drainage system should be connected to the municipal system and should have a gradient that ensures no wastewater stagnation, which may lead to the breeding of pests and flies. Healthcare facilities that do not have connectivity to the municipal drainage system need to ensure that sullage is collected in a soakage pit.

Soakage pit

Soakage pits function on the principle that effluent gets treated as it passes through the surrounding soil before entering the groundwater table or another water body. A soakage pit is a covered, porous-walled chamber that allows water to slowly soak into the ground.

Special Considerations for the Construction of a Soakage Pit

- It should be 20m away from the drinking water source.
- It should be 20m away from another soakage pit.
- It should have an adequate contact area with the surrounding soil to absorb the effluent (larger pits are needed for less permeable soils).

- Adequate openings need to be left in the walls of the pit to allow contact with the surrounding soil.
- The area for constructing a soakage pit should be sandy and should not be waterlogged.
- Applicability of Soakage Pit
- The construction of a soakage pit is applicable only in healthcare facilities where:
- The ground is permeable or consists of highly permeable sandy soil.
- The facility has a deep water table (at least 5m below the bottom of the soakage pit).
- Population density is low, and plot sizes are large.
- Water is supplied through pipelines.
- Septic tanks are well-maintained and de sludged regularly.

Drainage system

Healthcare facilities need to ensure that the drainage system is planned so that liquid waste generated from the healthcare facility does not become stagnant. The surface drainage should have proper connectivity with the municipal drainage system, with gradients that facilitate runoff water during rains.

For newly constructed healthcare facilities, it is recommended that departments generating liquid waste, such as laboratories, operating theatres (OT), Panchakarma theatres and laundries, have a separate plumbing and drainage system. This system should collect liquid waste from these departments and direct it to the healthcare facility's Effluent Treatment System.

Equipment and supplies for biomedical waste (BMW) management

For proper management of BMW generated from the health facility, it must be ensured that there is an adequate supply of materials needed for BMW management activities.

- For the ready availability of materials required for BMW management, hospitals need to have a dedicated budget for BMW activities.

Hospitals need to ensure the following:

- Staff must use appropriate PPE while carrying out BMW management activities in the healthcare facility.
- Regular inspections must be conducted to check the availability and use of different resources in various work areas.
- Records of the supply of PPE, chlorine solution, and other resources needed for BMW management should be maintained.
- At least one set of bins and liners should be provided at each point of generation for the collection of BMW waste and general waste.
- Needle cutters, burners, and puncture-proof containers must be available at each site for sharp waste generation.
- PPE should be provided to waste handlers, and their usage by staff should be monitored regularly.
- For the collection and transportation of BMW, wheel-based trolleys should be provided depending on the hospital's size and waste inventory.
- Concentrated or powdered chlorine solution for disinfection should always be available.
- Regular training sessions should be conducted for healthcare workers handling biomedical waste, and records of the training should be maintained.
- All healthcare workers handling biomedical waste should be immunized against Hepatitis B.

Statutory Compliances

Authorisation

- As per BMW Rules, 2016, every healthcare facility must obtain valid authorization from the State Pollution Control Board (SPCB) for BMW management activities.
- Healthcare facilities must apply to the Central Pollution Control Board (CPCB)/SPCB for authorization.
- Healthcare facilities must submit Form II under BMW Rules, 2016 & 2018 (Amendment) for authorization.
- Besides authorization, healthcare facilities must also ensure compliance with the following requirements.

Submission of annual report

- Healthcare facilities must submit an annual report to the prescribed authority (CPCB/SPCB) on or before July 31st every year.

- Annual reporting should be done using Form IVA as per BMW Rules, 2016 & 2018 (Amendment).
- Reports should include data from January to December of the preceding year.
- Healthcare facilities must upload the annual report to their website (if available).

Accident Reporting

- Healthcare facilities must report any major accidents related to BMW handling to the Pollution Control Board.
- Major accidents include:
    - Toppling of trucks carrying biomedical waste.
    - Accidental release of BMW into a water body.
    - Fire hazards, explosions, or deep burial pit erosion.
- Accident reports, including remedial actions taken, must be submitted within 24 hours using Form I as per BMW Rules, 2016 & 2018 (Amendment).
- Facilities must include accident data in their annual report to the Pollution Control Board.

Monitoring and Review

Healthcare facilities should establish a system for monitoring and reviewing BMW activities, managed by an Infection Control & Cleanliness Committee at the facility level. The Committee's responsibilities include:

- Streamlining BMW management in compliance with BMW Rules, 2016 & 2018 (Amendment).
- Defining responsibilities for staff involved in BMW collection, transportation, treatment, and disposal.
- Monitoring BMW handling practices.
- Conducting periodic training sessions for staff handling BMW.
- Maintaining records related to BMW management.
- Submitting accident and annual reports to the SPCB.
- Ensuring a valid authorization from CPCB/SPCB and a valid agreement with Common Biomedical Waste Treatment Facilities (CBMWTF).
- Taking remedial actions in case of accidents.
- Conducting Committee meetings at least every six months or immediately after an accident.
- Documenting meeting minutes and action plans, maintaining records, and forwarding them with the annual report to the Pollution Control Board.

Maintenance of records

Healthcare facilities must maintain the following records for BMW compliance:

- Authorization from SPCB.
- Annual reports submitted to SPCB.
- Accident reports, including "NIL" reports.
- BMW Register.
- Training records for BMW management (both induction and in-service training).
- Annual health check-up records of all employees.
- Vaccination records for all employees.
- Meeting minutes of the BMW Management Committee.
- Details of accidents, along with preventive and corrective actions.
- Records of effluent testing from the healthcare facility.
- Records of recyclable waste handed over to authorized recyclers.
- All BMW records must be retained for a period commensurate with the validity of authorization.
- Autoclave treatment records must be retained for at least five years.

D. INFECTION CONTROL

A clean and hygienic environment in a healthcare facility not only improves visitors' perception of the facility but also helps reduce Healthcare Facility Acquired Infections (HAIs). Healthcare-associated infections, also known as nosocomial or healthcare facility infections, affect patients in healthcare facilities and are not present or incubating at the time of admission. These infections may also appear after discharge or as occupational infections among healthcare staff. Patients receiving medical care in any healthcare facility are at risk of infection unless appropriate precautions are taken.

HAIs can be prevented through a robust Infection Control Program, which includes general cleaning, sanitation, infection control measures, monitoring of infection-related practices, proper handling of instruments and equipment, isolation practices, and surveillance of infection control activities. Most of these infections can be prevented by implementing readily available, cost-effective strategies, such as:

- Adhering to recommended infection prevention practices, especially hand hygiene and the use of PPE.
- Proper decontamination, cleaning, sterilization, and high-level disinfection of instruments.
- Improving environmental controls in high-risk areas such as operating rooms.
- Following proper isolation and barrier nursing techniques.
- Monitoring infection control activities, HAIs, and implementing corrective and preventive actions.

Key Components of Infection Control:

- Hand hygiene
- Personal protective equipment (PPEs)
- Personal protective practices
- Decontamination and cleaning of instruments
- Disinfection and sterilization of instruments
- Spill management
- Isolation and barrier nursing
- Infection control programme
- Hospital-acquired infection surveillance

Standard and Additional Precautions

In healthcare settings, many infections can be prevented and controlled by taking basic precautions that must be applied by every healthcare worker to all patients at all times, regardless of diagnosis or infectious status. Such precautions are termed as **"Standard Precautions"**, which every healthcare worker should practice and execute. These include:

Standard precautions

Hand Hygiene

Appropriate hand hygiene minimizes microorganisms acquired on the hands during daily duties and when there is contact with blood, body fluids, secretions, excretions, and known or unknown contaminated equipment or surfaces.

Use of Personal Protective Equipment (PPE)

Using PPE provides a physical barrier between microorganisms and the wearer. It offers protection by helping to prevent microorganisms from:

- Contaminating hands, eyes, clothing, hair, and shoes
- Being transmitted to other patients and staff

Appropriate Handling of Patient Care Equipment, Instruments, and Linen

Proper handling of instruments and equipment that come into contact with patient excretions or secretions ensures that there is no transmission of infections to staff or visitors, nor any new infection is transmitted to the patient. Ensure all reusable equipment is cleaned and reprocessed appropriately before being used on another patient. Proper handling of linen in contact with blood or body fluids prevents spillage and avoids contamination of clean linen.

Safe Handling of Biomedical And Hazardous Waste

Safe handling of biomedical waste (BMW) and hazardous waste in healthcare settings ensures that such waste does not adversely affect people's health or the environment. Proper handling of BMW also prevents injuries from needles, scalpels, and other sharp instruments.

Disinfection, Environment Cleaning, and Spill Management

Proper cleaning, disinfection of the environment, and spill management ensure that the facility remains dust-free and microorganism-free. This reduces the transmission of infections from surface areas and hazardous spills. Each of these standard precautions is detailed further in these guidelines.

Additional Precautions

Additional precautions are needed to control **transmission-based infections**. These include:

- **Airborne Precautions**
- **Droplet Precautions**
- **Contact Precautions**

Airborne Precautions

These precautions are designed to reduce the transmission of diseases spread by the airborne route. Airborne transmission occurs when droplet nuclei (evaporated droplets) less than 5 microns in size are disseminated in the air. These particles can remain suspended in the air for long periods, especially when bound to dust particles. Diseases such as tuberculosis, measles, chickenpox, and pneumonia can spread through this mode.

The following additional precautions should be taken to reduce/control airborne infection:

- Implement standard precautions
- Place the patient in a single isolation room
- Keep doors closed
- Anyone who enters the room must wear a special, high-filtration particulate respirator (e.g., N95 mask)
- Limit the movement and transport of the patient from the room to essential purposes only

Droplet Precautions

Droplet transmission occurs when there is adequate contact between the mucous membranes of the nose, mouth, or conjunctivae of a susceptible person and large particle droplets (>5 microns). These droplets are usually transmitted during coughing, sneezing, talking, or during procedures like tracheal suctioning. Diseases that may spread through this mode include diphtheria, influenza type B, meningitis, pneumonia, and pertussis.

The following precautions need to be taken:

- Implement standard precautions
- Place the patient in a single room or in a room with another person infected with the same pathogen
- Wear a surgical mask when working within 1–2 meters of the patient
- Place a surgical mask on the patient if transport is required

- Hand washing posters placed at each sink
- All critical areas should have alcohol-based hand rubs installed at the entry point of care
- Taps used for hand washing should preferably be elbow taps. If routine taps are used, paper should be used to turn off the tap to prevent recontamination of hands

Hand washing facility

When To Do Hand wash (5 Moments Of Hand Hygiene)

Each healthcare worker should perform hand hygiene as per the following moments:

Moment 1: Before Touching the Patient

To protect the patient against colonization and, in some cases, against exogenous infection by harmful germs carried on your hands. Therefore, it is essential to clean hands before touching a patient when approaching him/her. This applies to hand washing before:

- Shaking hands, before stroking a child's forehead.
- Assisting a patient in personal care activities: to move, to take a bath, to eat, to get dressed, etc.
- Delivering care and other non-invasive treatment: applying an oxygen mask, giving a massage.
- Performing a physical non-invasive examination: taking pulse, blood pressure, chest auscultation, recording ECG.

Moment 2: Before Clean/Aseptic Procedure

This is essential to protect the patient against infection with harmful germs, including his/her own germs, entering his/her body. It implies that hands should be cleaned immediately before accessing a critical site with infectious risk for the patient (e.g., a mucous membrane, non-intact skin, an invasive medical device). This applies to hand washing before:

- Brushing the patient's teeth, instilling eye drops, performing a digital vaginal or rectal examination, examining mouth, nose, and ear with or without an instrument, inserting a suctioning mucous.
- Dressing a wound with or without an instrument, applying ointment on a vesicle, making a percutaneous injection/puncture.
- Inserting an invasive medical device
- Disrupting/opening any circuit of an invasive medical device (for food, medication, draining, suctioning, monitoring purposes).
- Preparing food, medications, pharmaceutical products, sterile material.

Moment 3: After Body Fluid Exposure Risk

This is required to protect the service provider from colonization or infection with the patient's harmful germs and to protect the healthcare environment from germ spread. Hands should be cleaned as soon as the task involving an exposure risk to body fluids has ended.

Therefore, this applies to hand washing:

- When the contact with a mucous membrane and with non-intact skin ends.

- After a percutaneous injection or puncture; after inserting an invasive medical device (vascular access, catheter, tube, drain, etc.); after disrupting and opening an invasive circuit.
- After removing an invasive medical device.
- After removing any form of material offering protection (napkin, dressing, gauze, sanitary towel, etc.).
- After handling a sample containing organic matter, after clearing excreta and any other body fluid, after cleaning any contaminated surface and soiled material (soiled bed linen, dentures, instruments, urinal, bedpan, lavatories, etc.).

Moment 4: After Touching a Patient

This is required to protect oneself from colonization with patient germs and to protect the healthcare environment from germ spread. The principle is to clean hands after leaving the patient's side, after having touched the patient.

Situations when this applies:

- After shaking hands, stroking a child's forehead.
- After assisting the patient in personal care activities: moving, bathing, eating, dressing, etc.
- After delivering care and other non-invasive treatments: changing bed linen while the patient is in, applying an oxygen mask, giving a massage.
- After performing a physical non-invasive examination: taking pulse, blood pressure, chest auscultation, recording ECG.

Moment 5: After Touching Patient Surroundings

To protect service providers from colonization with patient germs that may be present on surfaces/objects in patient surroundings and to protect the healthcare environment against germ spread. Hands should be cleaned after touching any object or furniture when leaving the patient surroundings, without having touched the patient.

Applicable situations include:

- After an activity involving physical contact with the patient's immediate environment: changing bed linen with the patient out of the bed, holding a bed rail, clearing a bedside table.
- After a care activity: adjusting perfusion speed, clearing a monitoring alarm.
- After other contacts with surfaces or inanimate objects (note – ideally, try to avoid these unnecessary activities): leaning against a bed, leaning against a night table/bedside table.

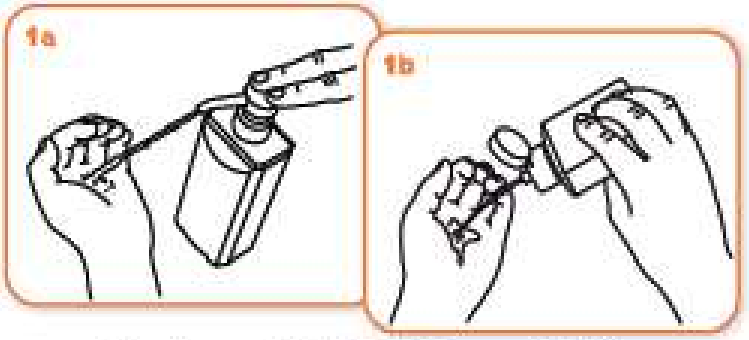
Hand washing technique:

The World Health Organization (WHO) recommends six main steps of hand washing, both through the use of soap and water hand wash and also by using alcohol-based hand rub. Both these techniques of hand washing are depicted in the following educational posters.

How to handrub?

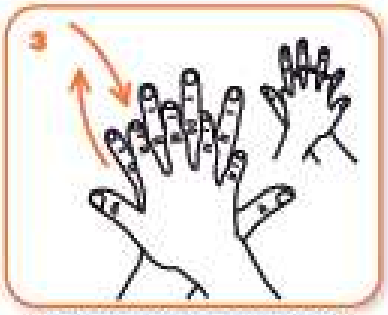
RUB HANDS FOR HAND HYGIENE! WASH HANDS ONLY WHEN VISIBLY SOILED!

Duration of the entire procedure: **20-30 sec.**

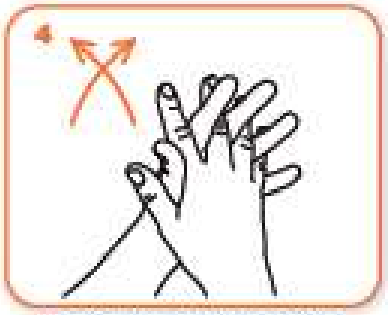


Apply a palmful of the product in a cupped hand, covering all surfaces.

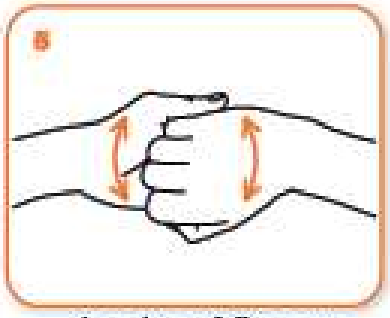
Rub hands palm to palm,



right palm over left dorsum with interlaced fingers and vice versa,



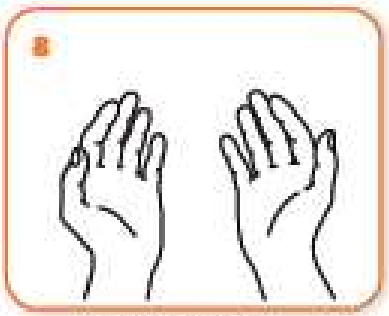
palm to palm with fingers interlaced,



backs of fingers to opposing palms with fingers interlocked,

rotational rubbing of left thumb clasped in right palm and vice versa,

rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa.



Once dry, your hands are safe.

Hand Hygiene Technique with Soap and Water

Duration of the entire procedure: 40-60 seconds

0

Wet hands with water;

1

Apply enough soap to cover all hand surfaces;

2

Rub hands palm to palm;

3

Right palm over left dorsum with interlaced fingers and vice versa;

4

Palm to palm with fingers interlaced;

5

Backs of fingers to opposing palms with fingers interlocked;

6

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

7

Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8

Rinse hands with water;

9

Dry hands thoroughly with a single use towel;

10

Use towel to turn off faucet;

11

Your hands are now safe.

Surgical Hand Hygiene

Surgical hand hygiene is standard care prior to any surgical procedure. Surgical hand preparation reduces 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, releasing bacteria into the open wound. In contrast to hygienic hand wash or hand rub, surgical hand preparation eliminates transient flora and reduces resident flora. It also inhibits the growth of bacteria under the gloved hand.

Figure II.3

Surgical hand preparation technique with an alcohol-based hand rub formulation

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

See legend for Image 3

5

See legend for Image 3

6

See legend for Image 3

7

See legend for Image 3

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

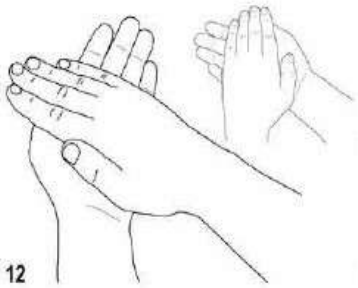
Dip the fingertips of your left hand in the handrub to decontaminate under the nails (5 seconds)

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)

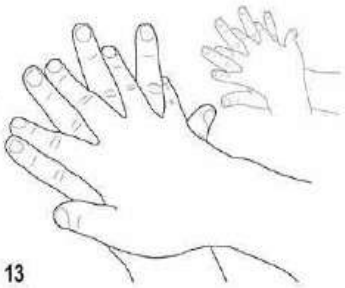
11

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)



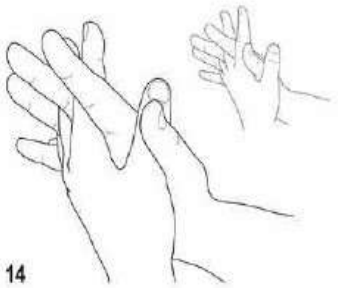
12

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

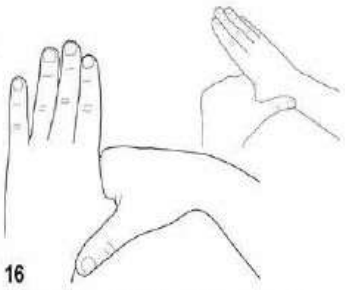


14

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.

Contact Precautions

Diseases transmitted by this route include colonization or infection with multiple antibiotic-resistant organisms, enteric infections, and skin infections.

The following precautions are needed:

- Implement standard precautions
- Place the patient in a single room or in a room with another person infected with the same organism
- Wear clean, non-sterile gloves when entering the room
- Wear clean, non-sterile gowns when entering the room if substantial contact with the patient, environmental surfaces, or items in the patient room is anticipated
- Limit the movement and transport of the patient from the room. Transport only for essential purposes, using precautions to minimize the risk of transmission

Hand Hygiene

Practicing hand hygiene is a simple yet effective way to prevent the spread of infections. Failure to perform appropriate hand hygiene is considered to be the leading cause of nosocomial infections and the spread of multi-resistant micro-organisms and has been recognised as a significant contributor to infection outbreaks. Hand hygiene is, therefore, the most important universal precaution to avoid the transmission of harmful germs and prevent healthcare-associated infections.

Any healthcare worker, caregiver, or person involved in direct or indirect patient care needs to adhere to proper hand hygiene practices and should be able to perform it correctly and at the right time.

Preferred Medium of Hand Hygiene

Soap and Water (Hand Wash)

- When visibly dirty
- When visibly soiled with blood or other body fluids
- After using the toilet
- Suspected or proven exposure to potential spore-forming pathogens, including outbreaks of *C. difficile* (preferred) and contact with patients of wet gangrene

Alcohol-based Hand Rub

- If hands are not visibly soiled
- 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 the 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 using an alcohol-based hand rub (ABHR) or washing hands with either plain or antimicrobial soap and water

Note:

- If (ABHR) is not available, wash hands with soap and water only
- Soap and (ABHR) should not be used concomitantly

Facilities for Hand Hygiene

All clinical areas in the hospital, including consultation chambers, nursing stations, phlebotomy centres, and critical care areas, along with other relevant areas like washrooms, should have:

- Hand washing facilities appropriate to the area
- Clear, unobstructed access to the hand washing sink
- Hand washing sinks designated for that purpose only
- Availability of running water at the point of use
- Liquid soap/soap dish with small soap bars
- Alcohol hand rubs at every point of care
- Hand drying facilities with clean blotting paper (even clean newspaper can be used) readily available at every sink

Other Aspects of Hand Hygiene

- Do not wear artificial fingernails or extenders when having direct contact with patients.
- Keep natural nails short (tips less than 0.5 cm long or approximately ¼ inch).
- Remove rings, watches, and bracelets before beginning the surgical hand scrub.
- Remove debris from underneath fingernails using a nail cleaner under running water.
- Surgical hand antisepsis using either an antimicrobial soap or an alcohol-based hand rub (ABHR) with persistent activity is recommended before donning sterile gloves when performing surgical procedures.
- When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for the length of time recommended by the manufacturer, usually 2-6 minutes. Long scrub times (e.g., 10 minutes) are not necessary.
- When using an alcohol-based surgical hand scrub product with persistent activity, follow the manufacturer's instructions. Before applying the alcohol solution, prewash hands and forearms with a non-antimicrobial soap and dry hands and forearms completely. After application of the alcohol-based product as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves.

Personal Protective Equipment (PPE)

PPE, as defined by the Occupational Safety and Health Administration (OSHA), includes specialized clothing or equipment worn for protection against infectious materials. In healthcare, PPE helps prevent contamination of mucous membranes, airways, skin, and clothing. PPE should be used appropriately to protect both healthcare workers and patients.

By implementing these infection control measures, healthcare facilities can significantly reduce the risk of HAIs, ensuring a safe environment for both patients and staff.

Examples of Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) includes various protective gear used in healthcare settings to ensure safety. Examples of PPE include:

- Gloves
- Face masks
- Aprons
- Gowns
- Eye wear
- Boots
- Shoe covers
- Caps/Hair covers
- Eye protection (wherever required)

Indications for Use of PPE

PPE should be used by:

- Healthcare workers providing direct patient care or working in environments where contact with blood, body fluids, excretions, or secretions is possible.
- Support staff, including medical aides, cleaners, and laundry staff, in situations where they may come into contact with potentially infectious materials.
- Laboratory staff handling patient specimens.
- Waste handlers.
- Family members providing care to patients, where exposure to blood, body fluids, secretions, or excretions is likely.

Additional Requirements for PPE

- Healthcare facility administration should ensure that an adequate number of high-quality PPE are available and easily accessible at the point of use.
- PPE should be stored in a clean, dry area to prevent contamination before use.
- Used PPE should be disposed of according to the Bio-Medical Waste (BMW) Rules, 2016.

Specifications for personal protective equipment

Article	BIS standards	Remarks
Gloves rubber	IS6994(pt 1):1973	House hold utility gloves can also be used
Gumboots/rubber shoes	IS 13695:1995	----None---
Apron cloth	IS 5029:1979	----None----
Apron rubber	IS 4892:1987/ISO 5235:1977 synthetic rubberaprons(reinforced)	Alternatively, rubber aprons for labour rooms can be used. IS 4501:1981
Facemask	IS 6190:1971	----None----
Respiratory full face masks	IS 14166:1994	For continuous exposure at waste disposal sites/ plants

Personal Protective Practices:

Principles for Use of PPE

Basic Principles for Use of PPE

- PPE should be chosen according to the risk of exposure. Healthcare workers should assess whether they are at risk of exposure to blood, body fluids, excretions, or secretions and choose their PPE accordingly.
- Avoid any contact between contaminated (used) PPE and surfaces, clothing, or people outside the patient care area.
- Discard used PPE in appropriate disposal bags and dispose of it as per BMW Rules, 2016.
- Do not share personal protective equipment.
- Change PPE completely and wash hands thoroughly each time one leaves a patient to attend to another patient or another duty.
- Alternatively, rubber aprons for labour rooms can be used (IS 4501:1981—None—for continuous exposure at waste disposal sites/plants).

Glove Use

Gloves are the most common type of PPE used in healthcare settings. The use of gloves helps to:

- Reduce the risk of contaminating healthcare workers' hands with blood and other body fluids.
- Reduce the risk of germ dissemination to the environment and transmission between healthcare workers and patients, as well as from one patient to another.

Type and Selection of Gloves

In healthcare settings, glove selection depends on various factors such as:

- Purpose of use (e.g., patient care, environmental cleaning).
- Type of procedure (e.g., general patient care, invasive procedures, handling specimens).

- Material of gloves (e.g., latex, vinyl, or nitrile).
- Single-use or reusable gloves.
- Sterile or non-sterile gloves.
- Proper fit for comfort and effectiveness.

Personal protective equipment for healthcare workers

Selection of gloves based on activity

S.no.	Activity	Type of glove
1	Routine handling of patient	No gloves required
2	When touching blood, body fluids, secretions, Excretions or mucous membrane	Clean non-sterile
3	Sample handling	Clean non-sterile
4	Invasive procedure including minor procedures & insertion of sterile devices such as urinary catheters	Sterile gloves
5	Environment cleaning	Heavy duty rubber gloves
6	Waste handling	Heavy duty rubber gloves
7	Instrument processing and cleaning	Heavy duty rubber gloves

Special Instructions for Use Of Gloves

- Wear gloves (clean, non-sterile) when touching blood, body fluids, secretions, excretions, or mucous membranes.
- Change gloves between contacts with different patients.
- Change gloves between tasks/procedures on the same patient to prevent cross-contamination between different body sites.
- Remove gloves immediately after use and before attending to another patient.
- Wash hands immediately after removing gloves.
- Use a plain soap, antimicrobial agent, or waterless antiseptic agent.
- Disposable gloves should not be reused but should be disposed of according to **BMW Rules, 2016**.

Dos and Don'ts Of Glove Use

DOs:

- Do wear the correct size glove, particularly surgical gloves. A poorly fitting glove can limit your ability to perform tasks and may be damaged (torn or cut) more easily.
- Do work from clean to dirty side, i.e., touch clean body sites or surfaces before touching the dirty or contaminated area.
- Do change gloves if torn or highly contaminated (even during use on the same patient). Change gloves after each patient use.
- Do keep fingernails trimmed moderately short (less than 3 mm or 1/8 inch beyond the fingertip) to reduce the risk of tears.
- Do pull gloves up over cuffs of the gown (if worn) to protect the wrists.
- Do use water-soluble (non-fat-containing) hand lotions and moisturizers often to prevent hands from drying, cracking, and chapping due to frequent hand washing and gloving.

DON'Ts:

- Don't touch your face or adjust PPE with soiled gloves.
- Don't touch environmental surfaces except as necessary during patient care.
- Don't use oil-based hand lotions or creams, as they will damage latex rubber surgical and examination gloves.
- Don't store gloves in areas where there are extremes in temperature (e.g., in the sun, near a heater, air conditioner, ultraviolet light, fluorescent light, or X-ray machines). These conditions may damage the gloves (cause breakdown of the material they are made of), thus reducing their effectiveness as a barrier.
- Don't reuse patient care gloves.

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

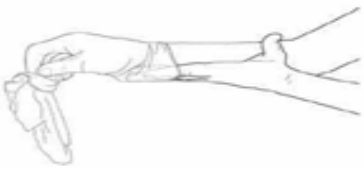
4. Take the second glove with the bare hand and touch only a restricted surface of glove corresponding to the wrist

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



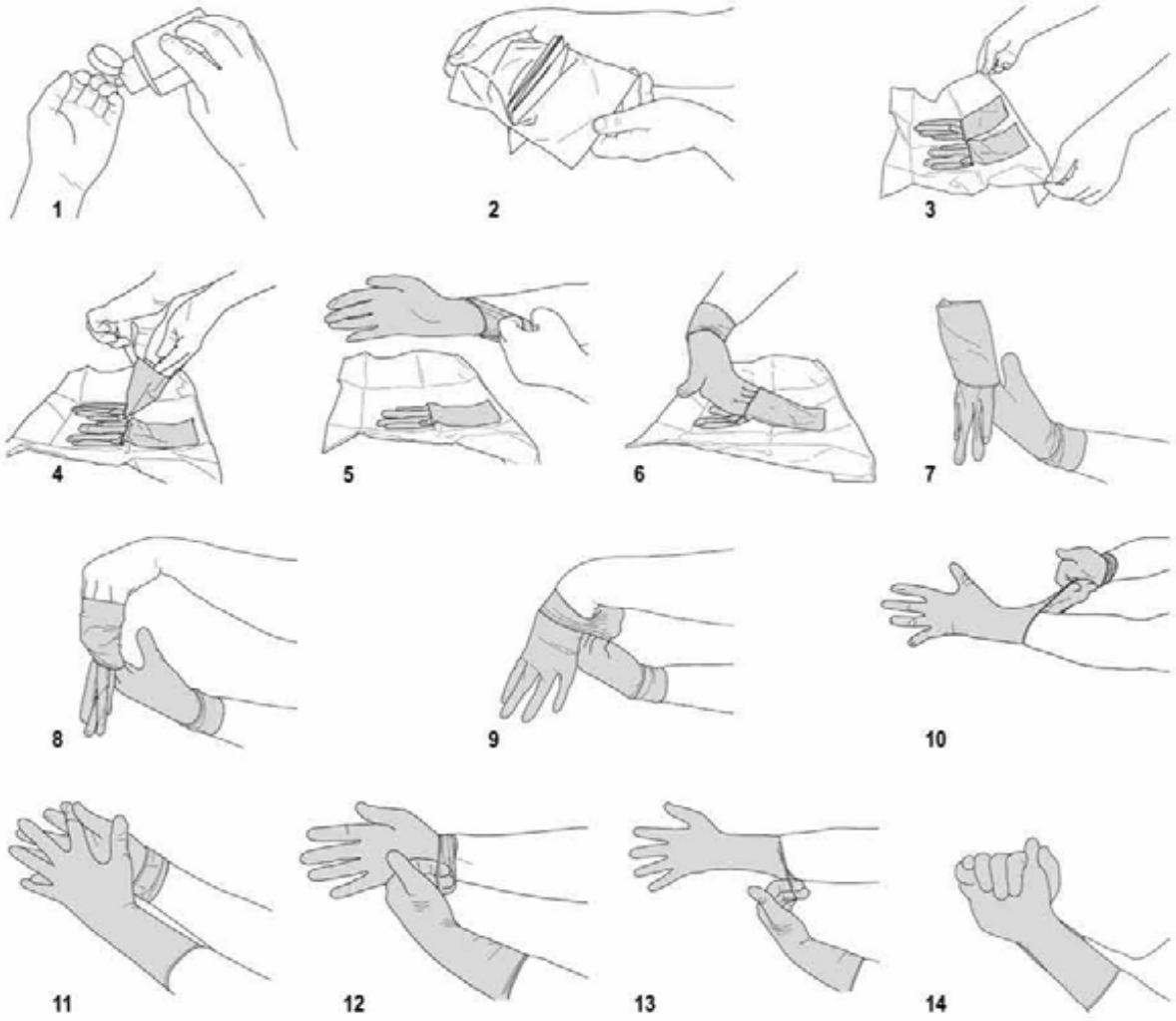
2. Hold the removed glove in the gloved hand and slide the fingers of the ungloved hand inside between the glove and the wrist. Remove the second glove by rolling it down the hand and fold into the first glove

3. Discard the removed gloves

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

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.

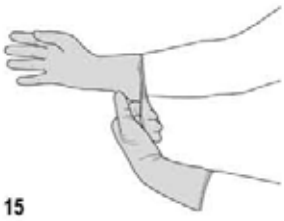
8-10. In a single movement, slip the second glove on to the ungloved hand while avoiding any contact/resting of the gloved hand on surfaces other than the glove to be donned (contact/resting constitutes a lack of asepsis and requires a change of glove).

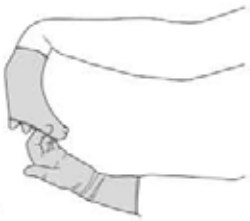
11. If necessary, after donning both gloves, adjust the fingers and interdigital spaces until the gloves fit comfortably.

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.

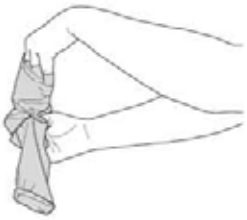
II. HOW TO REMOVE STERILE GLOVES

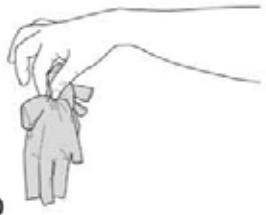

15

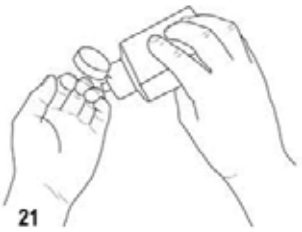

16


17


18


19


20


21

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.

Use of Gowns

Gowns made of impervious material are worn to protect the wearer's clothing/uniform from possible contamination with micro-organisms and exposure to blood, body fluids, secretions, and excretions. The gown is to be used only once for one patient and discarded or sent for laundering. Healthcare workers should remove gowns before leaving the unit.

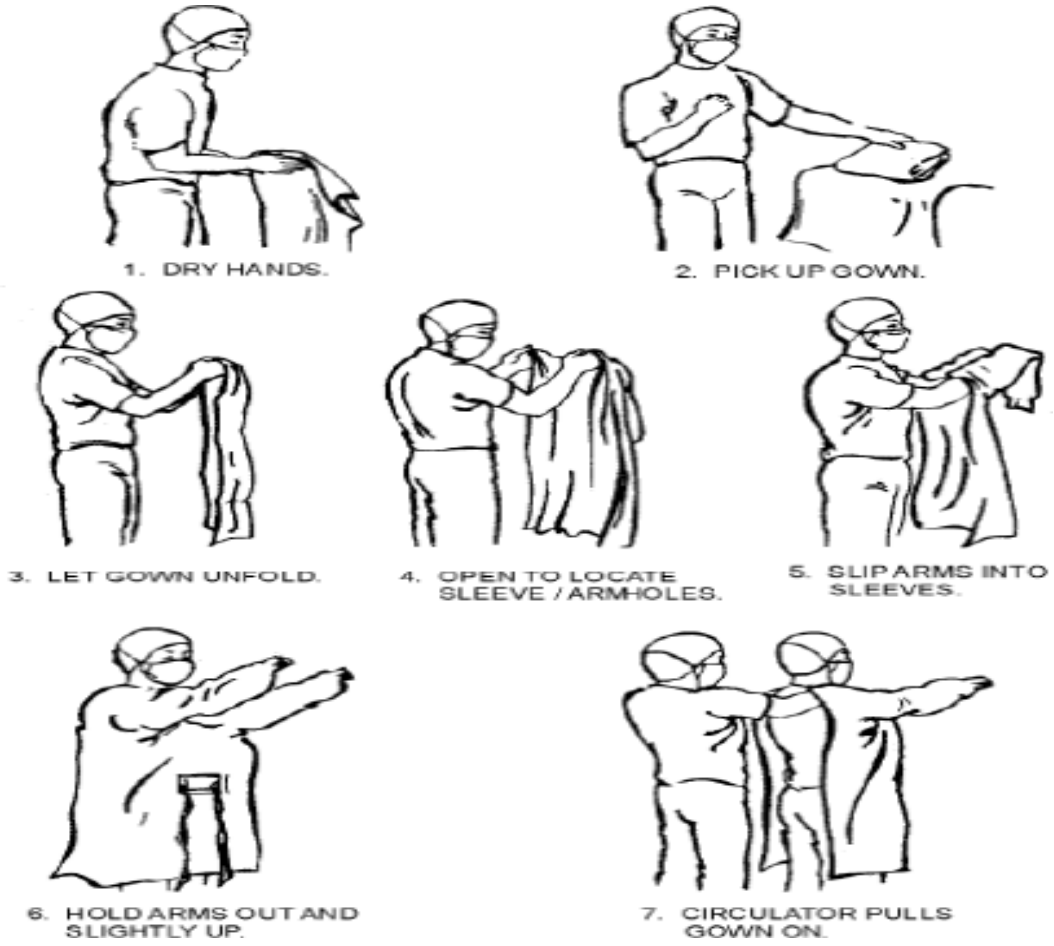
Selecting a Gown

Gowns need to be clean and non-sterile. The gown should be impervious and water-repellent. It should be long enough to cover the clothing of the wearer and should have long sleeves and a high neck. Disposable gowns are preferable. If they are not available, terycot (50% cotton and 50% polyester) reusable gowns can be used with a plastic apron underneath. Selection of gowns and aprons as PPE depends on the type of exposure and potential risk associated with the procedure or the work area with which they are associated. The aprons and gowns are meant to provide protection from the potential splash of blood and other infectious secretions.

Wearing the Gown

- Wash hands and dry.
- Hold the gown at the neck on the inside, permitting it to unfold.

- Slide hands and arms down the sleeves.
- Fasten the ties at the neck.
- Overlap the gown at the back as much as possible and secure the waistband.
- Request assistance to fasten the waist ties.



Use of Aprons

In the Indian healthcare scenario, aprons are used as general attire for healthcare workers, especially doctors. Aprons are used as PPE to protect the wearer and the uniform from contact with contaminated body fluids. Plastic aprons can be used over the gown when caring for patients where possible splashes with blood and body substances may occur.

Use of Caps

Caps are used when splashes of blood and body fluids are expected. Caps protect the hair from aerosols that may otherwise lodge on the hair and be transferred to other parts of the healthcare worker, such as the face or clothing, by the hands or onto inanimate objects.

Use of caps also prevents contamination of the patients and other items like food, instruments, and equipment from the hair fall of the healthcare worker. Caps of appropriate size, which are disposable and waterproof, should be used.

Removal of Caps

Remove by holding the inside of the cap, lifting it straight off the head, and folding it inside out. Caps should be discarded as per BMW Rules, 2016.

Correct method of wearing caps

Use of Masks

A surgical mask protects healthcare providers from inhaling respiratory pathogens transmitted by the droplet route. It prevents the spread of infectious diseases such as varicella (chickenpox) and meningococcal diseases (meningococcal meningitis). An N95 mask protects healthcare providers from inhaling respiratory pathogens that are transmitted via the airborne route, like pulmonary TB.

In order to prevent the spread of infection, an appropriate mask should be worn by healthcare providers and visitors when attending to a patient suffering from a communicable disease that is spread via the airborne or droplet route. The patient with a communicable disease spread via the droplet or airborne route should wear a surgical mask when being transferred to other departments or hospitals. Disposable masks are for single use only and should be discarded after use. They should not be stored in bags and re-used, shared, or hung around the neck, etc. If a mask is splashed wet, it should be changed using clean gloves and strict hand washing. A mask needs to be immediately replaced if it becomes soiled or damaged.

Selecting a Mask

A surgical mask should be worn in circumstances where there are likely to be splashes of blood, body fluids, secretions, and excretions or when the patient has a communicable disease that is spread via the droplet route. An N95 respirator mask needs to be chosen for those circumstances when a patient has a communicable disease that is spread via the airborne route.

Correct Method of wearing and removal of Mask

- Choose the appropriate mask size.
- Perform hand hygiene before putting on a mask.
- The mask should fit snugly over the face.
- The coloured side of the mask should face outwards with the metallic strip uppermost.
- For masks without a coloured side, the side with folds should face downwards on the outside, with the metallic clip uppermost (Image 1).
- For a tie-on surgical mask, secure the upper tie at the crown of the head, then secure the lower tie at the nape (Image 2).
- For ear-loop type masks, position the elastic bands around both ears.
- Mould the metallic strip over the nose bridge so that the mask fits snugly over the face (Image 3).
- Extend the mask to fully cover the mouth, nose, and chin (Image 4).
- Avoid touching the mask after wearing. Otherwise, perform hand hygiene before and after touching the mask.
- When taking off a tie-on surgical mask, unfasten the tie at the nape first, then unfasten the tie at the crown of the head (Image 5).
- For ear-loop type masks, hold both ear loops and take them off gently from the face. Avoid touching the outside of the face mask during removal, as it may be covered with germs.
- After taking off the surgical mask, discard it and perform hand hygiene.

Correct method of wearing mask

Use of protective eyewear/goggles

Protective eyewear/goggles should be worn at all times during patient contact when there is a possibility that a patient's body fluids may splash or spray onto the caregiver's face/eyes during procedures. The amount of exposure can be reduced through the use of protective eyewear. Full face shields may also be used to protect the eyes and mouth of the healthcare worker in such high-risk situations.

Ordinary spectacles do not provide adequate protection, although caregivers may wear their own glasses with extra protection added at the sides. Goggles that fit over glasses are available. Protective eyewear should be changed after each shift.

Decontamination and Cleaning of Instruments

Decontamination and cleaning are two highly effective infection prevention measures that can minimise the risk of transmission of HAI to healthcare workers or patients. These measures are also important steps in breaking the infection transmission cycle for patients. Both processes are easy to do and are inexpensive ways of ensuring that patients and staff are at a lower risk of becoming infected from contaminated instruments and other inanimate objects.

Decontamination of the environment surfaces after each patient use is done through the use of an effective decontaminating agent. The environment area of the patient has to be decontaminated and cleaned after each patient use. The operating tables, examination tables, dressing tables, etc., are to be cleaned using an appropriate disinfectant and as per the hospital policy of cleaning and disinfection.

Reprocessing of reusable instruments and equipment

Transmission of infection through used equipment and instruments can happen between patients through the use of unsterile or partially sterilized instruments and equipment and also to the staff through injury from the used instruments. To ensure that the instruments and equipment are safe to use, it is to be ensured by the health facility that it implements and follows basic processes of cleaning, disinfection and has a strong policy for reprocessing of the used instruments and equipment.

There are three types of instruments and equipment that need to be reprocessed:

- **Items that come in contact with intact skin** (e.g., stethoscopes) need to be routinely kept free of visible contamination. These require intermediate to low-level disinfection or washing with soap and water depending on the nature and amount of decontamination.
- **Medical instruments that pierce human tissue** (e.g., blades and scalpels) should be sterilised between each patient contact.
- **Medical instruments that touch but do not penetrate mucous membranes** (e.g., anaesthesia breathing circuits, laryngoscope blades, vaginal specula, flexible fibrotic endoscopes) should ideally be sterilized. If sterilization is not feasible, they should be reprocessed through high-level disinfection.

Spaulding's Classification of Medical Instruments and Required Level of Reprocessing

Classification	Definition	Level of Reprocessing	Example
Critical	Equipment/devices that enter sterile tissues, including the vascular system	Cleaning followed by sterilization	• Surgical instruments Implants • Biopsy instruments • Foot care equipment • Eye and dental equipment
Semi Critical	Equipment/ devices that comes in contact with non-intact skin or mucous membranes but do not penetrate them	Cleaning followed by high-level disinfection (as a minimum). Sterilization is preferred	• Respiratory therapy equipment • Anaesthesia equipment • Tonometer
Non Critical	Equipment/devices that touch only intact kin and not mucous membranes, or do not directly touch the client/ patient/resident	Cleaning followed by low-level disinfection (in some cases, cleaning alone is acceptable)	• ECG machines • Oximeters • Bedpans, urinals,com-modes

The six recommended steps of instrument reprocessing are listed as follows:

- Transportation of instruments/equipment

- Cleaning of instruments and equipment
- Packaging
- Disinfection of the instruments/equipment
- Sterilization
- Storage and issue

Transportation of Soiled Instruments

- Disposable sharps such as needles and blades shall be removed and disposed of in an appropriate puncture-resistant sharps container at the point of use, prior to transportation.
- If cleaning cannot be done immediately, the medical equipment/devices should be submerged in tepid water and/or detergent and enzymatic solution to prevent organic matter from drying on it.
- Gross soil should be removed immediately at the point of use if the cleaning process cannot be completed immediately after use.
- Soiled medical equipment/devices should be handled in a manner that reduces the risk of exposure and/or injury to personnel and clients/patients/residents or contamination of environmental surfaces.
- Closed carts or covered containers with easily cleanable surfaces need to be used for handling and transporting soiled medical equipment/devices.
- Soiled equipment/devices need to be transported by direct routes to areas where cleaning will be done.

Cleaning of the Instruments

The first step of equipment reprocessing is the thorough cleaning of equipment. Cleaning is of importance because:

- It is an effective way to reduce the number of micro-organisms, especially endospores that cause tetanus, on soiled instruments and equipment.
- Neither sterilization nor high-level disinfection is effective without prior cleaning.

Method of Cleaning

The process for cleaning includes protocols for disassembly, sorting and soaking, physical removal of organic material, rinsing, drying, physical inspection, and wrapping.

Disassembly

- Unless otherwise recommended by the manufacturer, equipment/devices should be disassembled prior to cleaning.
- The manufacturer's recommendations shall be followed when disassembling medical equipment/devices prior to washing.

Sorting and Soaking

- Sort equipment/devices into groups like products requiring the same processes of sterilization.
- Segregate sharps and/or delicate equipment/devices to prevent injury to personnel and damage to the equipment/devices.
- Soak equipment/devices in a hospital-approved instrument soaking solution to prevent drying of soil, making cleaning easier. Wear appropriate PPE.
- Saline should not be used as a soaking solution as it damages some medical equipment/devices.
- Detergent-based products, including those containing enzymes, may be used as part of the soaking process.
- Ensure that detergents (including enzymatic detergents) are appropriate to the equipment/device being cleaned.

Physical Removal of organic Material

- Completely submerge immiscible items during the cleaning process to minimize aerosolisation of micro-organisms and assist in cleaning.
- Remove gross soil using tools such as brushes and cloths.
- Employ manual or mechanical cleaning, such as ultrasonic cleaning, after gross soil has been removed.
- Ultrasonic cleaners are recommended for medical equipment/devices that can withstand mechanical cleaning, to achieve the required exposure for cleaning and to reduce potential risk to personnel.
- If manual cleaning is performed, physical removal of soil should occur under the water level to minimise splashing.

- Tools used to assist in cleaning, such as brushes, should be cleaned and disinfected after use.

Rinsing

Rinsing, following cleaning, is necessary as residual detergent may neutralise the disinfectant.

- Rinse all equipment/devices thoroughly after cleaning with water to remove residues that might react with the disinfectant/sterilant.
- Avoid the use of untreated well and bore well water; use safe drinking water for this purpose.

Drying

- Drying is an important step that prevents dilution of chemical disinfectants which may render them ineffective and prevents microbial growth.
- Follow the manufacturer's instructions for drying of the equipment/devices.
- Equipment/devices may be air-dried or dried by hand with a clean, lint-free towel. Lumens should be adequately flushed with air to ensure drying.
- Dry stainless steel equipment/devices immediately after rinsing to prevent spotting.

Inspection

- Visually inspect all equipment/devices once the cleaning process has been completed and prior to terminal disinfection/sterilisation to ensure cleanliness and integrity of the equipment/devices (e.g., cracks, defects, adhesive failures).
- Repeat the cleaning on any item that is not clean.
- Follow the manufacturer's guidelines for lubrication.
- Do not reassemble equipment/devices prior to disinfection/sterilisation.
- Monitoring of the cleaning activities should be done to justify the method and materials for cleaning. Monitoring should be done by physical observations.

Packaging

Packaging is a necessary step before sterilisation of the instruments is carried out by the hospital. It has to be ensured that packaging for sterilisation needs to be suitable for the sterilisation method used to ensure that the packaging material can be penetrated by the sterilisation agent (e.g., steam). The packaging also provides protection during transport and storage. Proper packaging protects the sterilised goods from micro bacterial recontamination during transport and storage. The packaging units are to be kept as small as possible. After sterilisation, the packaged material needs to be provided with labels indicating the contents, date of sterilisation, use-by date, batch number, and sterilisation indicator.

The recommended practices for packaging activity are as follows:

- Packaging systems should be compatible with the specific sterilisation process for which it is designed.
- Packaging materials need to be stored and processed to maintain the qualities required for sterilisation.
- Package contents need to be assembled, handled, and wrapped in a manner that provides for an aseptic presentation of package contents.
- Paper-plastic pouch packages should be used according to the manufacturer's written instructions.
- Packages to be sterilised should be labelled.
- Sterilised packages should be considered sterile until an event occurs to compromise the package barrier integrity.
- A chemical indicator/integrator should be placed inside each package, and an external chemical indicator affixed outside each package to be processed.

Packaging system of the sterile items should:

- Provide adequate seal integrity and be tamper-proof.
- Provide an adequate barrier to particulate matter.
- Withstand physical conditions of the sterilisation process.
- Provide an adequate barrier to fluids.
- Permit adequate air removal.
- Allow penetration and removal of sterilant.
- Protect package content from physical damage.
- Resist tears and punctures.
- Be free of holes.
- Be free of toxic ingredients.
- Have a low lint content.

- Be used according to the manufacturer's written instructions.

Disinfection and sterilization of equipments

Disinfection of Instruments

Disinfection removes micro-organisms without complete sterilisation. Disinfection is used to destroy organisms present on delicate or heat-sensitive instruments which cannot be sterilised or when single-use items are not available. Disinfection is not a sterilising process and should not be used as a convenient substitute for sterilisation. Thermal disinfection is not appropriate for instruments that will be used in critical sites, and these must be sterile.

Certain products and processes provide different levels of disinfection. They fall into three major categories:

- Low-level disinfection
- Intermediate-level disinfection
- High-level disinfection

Low-Level Disinfection

It kills most bacteria, some viruses, and some fungi, but may not be reliable to kill more resistant bacteria such as *M. tuberculosis* or bacterial spores.

Intermediate-Level Disinfection

Inactivates *Mycobacterium tuberculosis*, vegetative bacteria, most viruses, and most fungi, but does not always kill bacterial spores.

High-Level Disinfection (HLD)

Destroys all micro-organisms except some bacterial spores (especially if there is heavy contamination). This is an alternative to sterilisation when either sterilisation equipment is not available or it is not feasible to carry out sterilisation.

High-level disinfection of instruments can be performed through:

- Pasteurisation (Boiling in water)
- Chemical disinfectants

Pasteurisation

If an instrument is able to withstand the process of heat and moisture and is not required to be sterile, then thermal disinfection is appropriate. By using heat and water at a temperature that destroys pathogenic, vegetative agents, this is a very effective method of disinfection. The level of disinfection depends on the water temperature and the duration of the instrument's exposure to this temperature.

Minimum surface temperature and time required for thermal disinfection*

Surface temperature (°C)	Minimum disinfection time required (In minutes)
90	1
80	10
75	30
70	100

Semi-Critical Medical Equipment/Devices and Pasteurisation

Semi-critical medical equipment/devices suitable for pasteurisation include equipment for respiratory therapy. Equipment/devices require thorough cleaning and rinsing prior to pasteurisation. Advantages of pasteurisation include a rapid disinfection cycle and moderate cost of machinery, but a major disadvantage is that it is hard to validate the effectiveness of the process.

While performing HLD using pasteurisation, it has to be ensured that:

- The process should be monitored with mechanical temperature gauges and timing mechanisms for each load.
- Cycle time of disinfection should be verified manually and recorded for each cycle.
- Calibration of pasteurisation equipment should be performed according to the manufacturer's recommendations.

- Daily cleaning of pasteurising equipment is required.

Following pasteurisation, medical equipment/devices need to be handled in a manner that prevents contamination. Equipment/devices need to be transported directly from the pasteuriser to a clean area for drying, assembly, and packaging.

HLD Using Chemicals

The performance of chemical disinfectants is dependent on the following factors:

- Temperature
- Contact time
- Concentration and pH
- Presence of organic or inorganic matter
- Resistance of the initial bioburden on a surface

Steps of HLD Using Chemicals

Glutaraldehyde is recommended as the most appropriate chemical disinfectant to provide HLD. The following steps should be taken:

- First and foremost, clean the contaminated instruments thoroughly as per instructions. The instruments are then dried thoroughly before placing them in the disinfectant solution.
- Completely immerse all items in the HLD.
- Record the time and soak the instruments for at least 20 minutes.
- Remove the items using sterile forceps or gloves.
- Rinse well with boiled and filtered water three times and use immediately or dry with a sterile cloth.

During HLD, it has to be ensured that:

- Prepared solutions shall not be topped up with fresh solution.
- During manual disinfection, it is to be ensured that the container used for disinfection is kept covered during use and washed, rinsed, and dried when the solution is changed.
- Each device shall be thoroughly rinsed following chemical HLD, according to the chemical manufacturer's instructions.
- Unless a device is to be used immediately, it shall be thoroughly dried.
- Drying of non-critical devices may be done by air-drying or other methods.

Note:

1. There is no single ideal disinfectant. Different grades of disinfectants are used for different purposes.
2. Only instrument-grade disinfectants are suitable for medical instruments and equipment.
3. Hospital-grade or household-grade disinfectants must not be used on instruments; they are only suitable for environmental purposes.

Sterilization of Instruments

Sterilization is the elimination of all disease-producing micro-organisms, including spores (e.g. *Clostridium* and *Bacillus* species) and prions. Sterilization is used on critical medical equipment/devices and, whenever possible, semi-critical medical equipment/devices. All critical instruments that enter sterile tissues, including the vascular system (e.g. forceps, foot care equipment, dental handpieces, etc.), present a high risk of infection if the equipment/device is contaminated with any micro-organisms, including bacterial spores. All these critical instruments need to be sterilised before the next usage. Before any instrument or equipment goes under the process of steam sterilisation, the following should be checked:

- Ensure that the instrument can withstand the process (e.g. steam under pressure).
- Ensure that the instrument has been adequately cleaned.
- Ensure that the instrument does not require any special treatment.
- Ensure that records of the sterilisation process and for the traceability of instruments are kept.

Sterilization of Medical Instruments

Sterilisation of medical instruments can be achieved through:

- Thermal Sterilisation
- Chemical Sterilisation

Thermal sterilisation

Thermal sterilization is performed via:

- Wet Sterilization: Exposure to steam saturated with water at 121°C for 30 minutes or 134°C for 13 minutes in an autoclave. Please note these cycle parameters differ based on the autoclave type (gravity/dynamic air removal) and should be followed as per the type of autoclave.
- Dry Sterilization: Exposure to 160°C for 120 minutes or 170°C for 60 minutes. This sterilisation process is often considered less reliable than the wet process, particularly for hollow medical devices. It should mainly be used for lab glassware and oils. Metal instruments are very likely to be damaged by this process.

Do not perform sterilization for equipment that is not compatible with heat sterilization, such as endoscopes or fiber optic scopes. These should be processed using High-Level Disinfectants (HLDs).

Chemical sterilization

Chemical sterilisation, also known as cold sterilisation, is used for instruments that are likely to be damaged by heat. It is based on the premise that some HLDs can kill endospores after prolonged exposure (10-24 hours). Chemical sterilisation may be achieved using 2-4% Glutaraldehyde Solution, by immersing the instruments for a minimum contact time of 10 hours.

Flash sterilization

Flash sterilisation is a modification of conventional steam sterilisation, where the flashed item is placed in an open tray or a specially designed, covered, rigid container to allow rapid steam penetration. Flash sterilisation is performed on unwrapped objects at 132°C, with 27-28 lbs pressure, and a minimum exposure time of 3 minutes. It should only be used in case of a dropped instrument during surgery and never as a routine method of sterilisation.

Storage

Storage of instruments and equipment is a very important component to maintain their sterility or disinfection. Most instruments and equipment should be dry and packaged once they have been sterilized.

- They should be stored in a clean, dry environment and protected from any damage.
- Correct storage of sterile instruments and equipment is crucial for keeping them sterile.

Maintaining sterility

- Proper storage conditions are essential to maintain the integrity of sterilized items. Thus, healthcare settings should have procedures for the storage and handling of clean and sterile medical equipment/devices that include:
  - ✓ The end-user should check the integrity of the package before use.
  - ✓ Sterile medical equipment/devices should be used before the expiration date.
  - ✓ Stock should be rotated so that the oldest stock is used first.
  - ✓ Sterility should be maintained until used.
  - ✓ Sterile packages that lose their integrity should be re-sterilized before use.
  - ✓ Equipment/devices should be handled in a manner that prevents recontamination of the item.

Monitoring of the sterilising process

Quality control parameters for the sterilization process, which also serve as a checklist for the sterilization department, include:

- Load number
- Load content

  Temperature and time exposure record chart

  Chemical indicator testing (with each load)

  Biological indicator testing (at least weekly)

Regular maintenance of sterilization equipment should be performed, and documents should be maintained.

Monitoring of the sterilising process is carried through mechanical, chemical, and biological indicators.

Mechanical Indicators

- Mechanical monitoring involves checking the steriliser gauges, computer displays, or printouts, and documenting sterilisation records that pressure, temperature, and exposure time have reached the levels

recommended by the steriliser manufacturer. Since these parameters can be observed during the sterilisation cycle, this might be the first indication of a problem.

- The mechanical monitors for steam sterilisation include the daily assessment of cycle time and temperature by examining the temperature record chart (or computer printout) and an assessment of pressure via the pressure gauge.
- The mechanical monitors for ETO include time, temperature, and pressure recorders that provide data via computer printouts, gauges, and/or displays.

Chemical Indicators

- Chemical monitoring uses sensitive chemicals that change colour when exposed to high temperatures or combinations of time and temperature. Examples include chemical indicator tapes, strips, or tabs and special markings on packaging materials.
- Chemical indicator results are obtained immediately following the sterilisation cycle and therefore can provide more timely information about the sterilisation cycle than a spore test.
- A chemical indicator should be used inside every package to verify that the sterilising agent has penetrated the package and reached the instruments inside. If the internal chemical indicator is not visible from the outside of the package, an external indicator should also be used. External indicators should be inspected immediately when removing packages from the steriliser; if the appropriate colour change did not occur, do not use the instruments. Chemical indicators help to differentiate between processed and unprocessed items, eliminating the possibility of using instruments that have not been sterilised.
- The two categories of chemical indicators are single-parameter and multi-parameter. A single-parameter chemical indicator provides information about only one sterilisation parameter (e.g., time or temperature). Multi-parameter chemical indicators are designed to react to two or more parameters (e.g., time and temperature or time, temperature, and the presence of steam) and can provide a more reliable indication that sterilisation conditions have been met.
- Chemical indicators (no matter what class or type) do not verify sterility and do not replace the need for weekly spore testing.

Biological indicators

- Biological indicators, or spore tests, are the most accepted means of monitoring sterilisation because they assess the sterilisation process directly by killing known highly resistant micro-organisms (e.g., *Geobacillus* or *Bacillus* species).
- However, because spore tests are only done weekly and the results are usually not obtained immediately, mechanical and chemical monitoring should also be done on a daily basis.

Isolation and barrier nursing

Isolation for the control of infection is used to prevent infected patients from infecting others (source isolation) and/or to prevent susceptible patients with weak immune systems from being infected (protective isolation). Isolation and barrier nursing must be followed by the hospital to prevent the spread of infections to other patients or medical staff from patients carrying infections.

Barrier nursing is a set of stringent infection control techniques used in nursing. The aim of barrier nursing is to protect medical staff against infection by patients, particularly those with highly infectious diseases.

Isolation is defined as the voluntary or compulsory separation and confinement of those known or suspected to be infected with a contagious disease agent (whether ill or not) to prevent further infections. In this form of isolation, transmission-based precautions are imposed.

Minimum Requirements for Isolation and Barrier Nursing

Single Room

Single rooms reduce the risk of transmission of infection from one patient to others, whether through direct or indirect contact transmission. A single room should have the following facilities:

- Hand washing facilities
- Attached toilet and bathroom facilities

Cohorting

This is also one strategy of infection control if a single room is not possible or there is a shortage of single rooms. During cohorting, patients infected with the same organism can be cohorted (sharing of room/s).

Cohorting may be done during outbreaks. A ward may be designated for this purpose, and it should be clearly segregated from the other patient care areas.

Provision of Isolation Ward

- Every hospital needs to have a provision for an isolation ward for all infectious patients being admitted to the hospital.
- It is to be ensured by the hospital that infectious patients are admitted to the isolation ward only and no general patient is admitted to the isolation ward.
- An air handling system providing 6-12 air changes per hour with the air being discharged outside through a filtration mechanism is recommended. These systems should be checked periodically to ensure that they are offering a negative pressure room.
- An air-conditioned single room with an exhaust or a well-ventilated room may also be a good idea for health facilities.
- The isolation ward in hospitals needs to have self-closing doors.

Spacing between Beds

- It is recommended that hospitals have a single room for the placement of patients in need of isolation.
- In hospitals where it is not possible to have a single room for isolation patients and patients are kept in a common isolation ward, there is a need to have proper bed spacing between two beds to minimize the transmission of patient-to-patient infection.
- A minimum bed spacing of 1.2 metres is recommended for spacing between the two beds in an isolation ward to reduce the risk of cross-transmission from direct or indirect contact or droplet transmission.

Restriction of external footwear in critical areas

To ensure a safe and infection-free environment in critical areas of the hospital, hospital authorities must follow these protocols for visitors and staff while entering these areas.

While entering critical areas such as the OT, Panchakarma theatres etc., all staff and visitors must ensure the following:

- External footwear should not be allowed inside critical areas. The hospital should provide dedicated footwear for these areas or encourage the use of shoe covers.
- All staff and visitors accessing critical areas must adhere to the protocol of wearing PPE, including gowns, masks, gloves, and shoe covers, and should use hand sanitizers before and after entering these areas.

Restriction of visitors to the isolation area

- Staff involved in patient care must inform patients and relatives about the necessary measures and the importance of visitor restrictions.
- Patients and their relatives should receive health education regarding the cause, spread, and prevention of infections.
- Visitor movement is restricted in critical areas such as the OT, panchakarma theatres, procedure rooms etc. Where appropriate, staff and visitors should wear PPE to protect patients from micro-organisms.
- To minimize infection risk, only one attendant is allowed in the isolation area. All visitors must wait for their turn before accessing these areas.
- Children below 12 years of age should not be allowed into isolation areas.
- Visitors must leave their footwear, bags, and other belongings outside the room.
- Visitors should not sit on the patient's bed.
- Flowers or plants should not be placed in the patient's room.
- Visitors who are sick are not allowed to enter critical areas.

Hospital Infection Control Programme

The staff involved in the delivery of healthcare services is responsible for the prevention of HAIs at the facility. While all the activities, as mentioned in this section of the guideline, are required to be carried out to minimize the risk of HAIs, a formal administrative structure is important for continuous monitoring of these activities. The principal goal of the infection control programme is the prevention of nosocomial infection in patients, personnel, and visitors in order to provide a safe environment for patients and personnel in the process involving every member of the hospital in the surveillance, prevention, and control of nosocomial infections.

The administrative structure and processes related to the prevention of HAIs need to be defined and included in the "Hospital Infection Control Programme".

The key components of the infection control programme include the Hospital Infection Control Committee, monitoring of daily activities for infection control, having an antibiotic policy in place, ensuring occupational safety of staff through immunization and regular health check-ups, ensuring proper environmental control measures, and monitoring of HAI rates.

Hospital infection control and cleanliness committee

For monitoring the activities related to infection control in the facility, a Hospital Infection Control Committee needs to be formed. This Committee will be directly responsible for ensuring that the facility and employees comply with the requirements of infection control in the facility. The Hospital Infection Control Committee needs to be formed with an official order undersigned by the head of the facility.

The suggested composition of the Hospital Infection Control Committee is listed as follows:

- Medical Superintendent/Medical Officer In-charge - Chairperson
- Nursing In-charge/Infection Control Nurse - Convener
- MO/Physician/Microbiologist with knowledge of infection control - This person will also be designated as Infection Control Officer.
- Surgeon
- Lab Technician
- Hospital Manager/Quality Manager
- Pharmacist
- Housekeeping In-charge

The overall responsibility of this Committee is to:

- Develop and approve infection control policies and implement infection control practices in the hospital.
- Conduct internal assessment using the "Kayakalp" checklist at least once in a quarter, identify gaps, and prepare an action plan based on findings.
- Monitor and review the progress of the facility towards meeting "Kayakalp" criteria.
- Ensure periodic microbiological surveillance, collection, and analysis of data related to HAIs.
- Direct resources to address problems identified for effective management of the infection control programme.
- Ensure the availability of appropriate supplies needed for infection control at the facility.
- Facilitate and support the training of staff related to housekeeping and infection control.
- Monitor the housekeeping and cleanliness activities, including services provided by outsourced agencies.
- Monitor hand hygiene practices in patient care areas.
- Monitor proper segregation and storage of BMW.
- Coordinate and monitor waste disposal services provided by a common treatment facility provider.
- Ensure periodic medical check-ups and immunization of staff.
- Monitor the hygiene of staff, especially food handlers and cleaning staff.
- Ensure that all clinical and support staff of the hospital adhere to a defined dress code.
- Develop and implement SOPs on cleanliness and infection control.
- Involve members of "HMC" and LSGD for monitoring and promotion of hospital cleanliness.
- Promote hygiene among patients and visitors through the display of IEC materials and counseling.
- Facilitate the development of an antibiotic policy for the hospital.
- Report outbreaks of nosocomial infections in the facility.
- Participate in outbreak investigations of nosocomial infections.
- Submit monthly reports to the district and/or state level as required.
- Meet at least once a month and review the progress towards meeting criteria for cleanliness and infection control.
- Ensure compliance with all applicable legal provisions regarding waste management and environmental control, including BMW Management Rules 2016 & 2018 (Amendment) as mandated in clause 4 (r).

Meeting schedule and recording of the proceedings

The Infection Control Committee in the hospital has to meet at least once every month to review the activities carried out in the hospital related to infection control. The focus of the review is to analyse regular

monitoring activities and HAI surveillance activities being carried out in the hospital.The Committee also needs to meet in the event of any hospital infection outbreak and when required. The Committee should meet with a pre-defined agenda, and all the proceedings of the meeting need to be recorded in the minutes of the meeting, along with the attendance record, agenda of discussion, planned actions and suggestions, and delegation of responsibility.

Monitoring of infection control practices

The Infection Control Committee needs to carry out regular daily monitoring of infection control practices being followed by the staff. The focus of this monitoring is to ensure that the staff regularly follows and practices infection control measures like hand washing, use of PPE, barrier and isolation nursing, and also the resources available for carrying out these activities, such as the availability of an appropriate number of PPE, availability of hand washing facilities like elbow-operated taps, hand wash, and hand washing posters.This regular monitoring of infection control activities through daily rounds needs to be carried out by the members of the Infection Control Committee, preferably through the hospital infection control nurse/nursing in charge. This monitoring is to be carried out in a proper format and needs to be signed by the monitoring authority. All records of the monitoring activities need to be discussed in the Infection Control Committee meeting, and records need to be kept for proving compliance.

Occupational health and safety

The healthcare staff is at potential risk of infection owing to their exposure to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air. Therefore, prevention strategies have to be part of the Hospital Infection Control Programme. Infection control objectives of the personal health service should be an integral part of a healthcare organisation's general programme for infection control. The objectives may be:

- Educating healthcare staff on the principles of infection control and individual responsibility.
- Teaming up with the infection control department in monitoring and evaluating potentially harmful infectious outbreaks and exposures.
- Providing care if a healthcare staff member is exposed to an occupational hazard.
- Identifying work-related risks and constituting preventive measures to mitigate them.
- Reducing costs by preventing infectious diseases that result in absenteeism and disability.

The elements of healthcare staff safety can be elaborated as follows:

- ✓ **Coordination with Other Departments**
  - For achieving appropriate standards of infection control, the activities of healthcare staff should be coordinated with infection control and other appropriate department personnel. This would help in adequate surveillance of infections and provision of preventive services.

- ✓ **Pre placement evaluation**
  - Medical evaluation of the staff prior to their placement in a health facility can ensure that they are not placed in jobs that would pose undue risk of infection to them, other staff, patients, or even visitors. The evaluation should include details of immunisation status and obtaining histories of any condition that might predispose personnel to acquiring or transmitting communicable diseases. A detailed physical examination needs to be carried out for all personnel joining the facility.

- ✓ **Healthcare Staff Health and Safety Education**
  - To increase compliance of the staff with infection control measures, staff orientation, education, and training on basic infection control principles are imminent. Clearly written policies, guidelines, and SOPs provide clarity of instruction and ensure uniformity and effective coordination of activities.

- ✓ **Immunisation Programmes for Service Providers**
  - A continuous, ongoing vaccination programme would be required in the facility, and all staff need to be immunised against potential exposure to communicable diseases, especially tetanus

and Hepatitis B. A comprehensive medical check-up needs to be undertaken for every staff member at the time of joining.

✓ **Regular Health Check-up of the Staff**

- It has to be ensured by the health facility that it has a policy of conducting regular health check-ups for all staff. Regular health check-ups should include comprehensive medical assessment, immunisation status, and deworming of the staff, especially food handlers and housekeeping staff.

✓ **Maintenance of Records**

- It is to be ensured by the health facilities that they maintain all health records of the employees of the hospital. The health records contain details of comprehensive medical assessment, immunisation status, PEP (if any), and deworming records. These records need to be stored along with the personal records of the employees, and confidentiality of the same has to be ensured.

Hospital Acquired Infection Surveillance

For effective implementation of the infection control programme and ensuring the effectiveness of the activities related to infection control, hospitals need to carry out the surveillance of these activities and take appropriate corrective and preventive actions based on the results of the surveillance. Surveillance is one of the most important components of an effective infection control programme. It is defined as the systematic collection, analysis, interpretation, and dissemination of data about the occurrence of HAIs.

Surveillance of hospital-associated infections involves recording and counting infections arising in the hospital. Surveillance provides ways to identify and clarify quality issues, understand the causes, and then plan corrective actions to rectify them, bringing about long-term improvements. Hospitals need to carry out targeted surveillance of high-risk or critical areas and procedures, as identified by the hospital.

The minimum activities that hospitals need to carry out for the surveillance of HAI include:

- Microbiological surveillance of critical areas
- Monitoring of surgical site infection rates
- Monitoring of device-related HAI rates
- Monitoring of blood-related and respiratory tract HAI
- Corrective action on occurrence of HAI

Microbiological Surveillance of Critical Areas

- Do not perform routine environmental sampling in any hospital location except the operation theatres. The presence of an organism on a surface does not confirm it as the cause of infection in patients in that area, even if it is the same strain.
- Routine environmental surface sampling (swabs) should not be done in areas like the ICU and/or wards. Take corrective actions if any growth of micro-organisms is found to be positive.

Environmental sampling should be done for the following purposes only:

- Monitoring the effectiveness of the cleaning and disinfection procedures in certain situations as a part of quality assurance (e.g., the operation theatre)
- As a part of an epidemiological investigation of an outbreak in which environmental sources/reservoirs or transmission routes are suspected
- Monitoring the quality of water for drinking, cleaning, surgical scrub, and after flooding

Microbiologic Monitoring of the OT

Since the OT is designed to function as a clean room and microbial burden control is the most important here, routine environmental surface and air sampling should be done in all OTs.

OT Swabs:

- Surface swabs need to be obtained from each OT for microbiological culture testing as per the hospital infection control programme.
- The sampling process should be as follows:

- Sampling should be done as soon as the OT is opened in the morning before any cleaning is done.
- Obtain the required numbers of sterile swabs and media from the microbiology lab before taking samples; keep the swabs and media outside the refrigerator for at least 30 minutes (they should be at room temperature when the sample is taken).
- Label the sampling media with the date, OT number, and sample site (e.g., table, trolley, etc.).
- Change into OT dress, wear a cap, mask, sterile gown, and sterile gloves, and enter the OT with the swabs and media.
- The ventilation system/AC should be kept off. It may be turned on if air sampling is to be done at the same time.
- Swabs should be collected from the following locations in each OT (different from sampling after new OT construction or OT renovation):
  - OT table
  - OT lights
  - Sterile instruments trolley (If more than one trolley is present, all should be sampled)
  - The medication preparation surface of the anaesthesia machine
  - Floor – one swab of the floor adjacent to the OT table
  - Any one wall at waist to shoulder height
- Collect samples using aseptic technique.
- The samples should be sent to the laboratory immediately after collection. Do not place collected samples in the refrigerator.
- Maintain a record of the samples sent.

- The laboratory should test the swabs for the presence of both aerobic and anaerobic bacteria (both spore-forming and non-spore-forming ones).
- Any growth in the swabs should immediately be communicated by the laboratory to the hospital authorities.
- The test reports should be informed to the Chairperson, Infection Control Committee and filed for records.

Suggested actions for OT swab culture

Organism grown	Remark	Action
No organisms grown	Acceptable	Use the OT
Skin commensals e.g., S epidermid is (sparsegrowthinany1-2swabsfrom the sample set)	Acceptable	Use the OT (unless the lab reports heavy growth or growth from multiple swabs). Re-clean positive growth locations before using the OT.
Known pathogen(Saureus)	Unacceptable	Do not use the OT. Re-clean, re-fogg and repeat swab samples
Gram negative organisms (aerobic/ anaerobic)	Unacceptable	Do not use the OT. Re-clean, re-fogg and repeat swab samples
Aerobic/anaerobic spore bearers	Unacceptable	Do not use the OT. Re-clean, re-fogg and repeat swab samples
Mixed growth	Unacceptable	Do not use the OT. Re-clean, re-fogg and repeat swab samples

Corrective and preventive actions in case of unacceptable results

- Postpone elective cases. Repeat cleaning, disinfection, and OT swabs. The procedure should be supervised by the OT in-charge.
- All cases operated in the duration between sampling and reporting of unacceptable swab results should be identified and followed up for surgical site infection.
- Investigate the causes of unacceptable results. Check the chemical dilution methods, cleaning techniques, cleanliness of mops and buckets, and function of the fogger machine. The lab should check the sample collection and processing methods used.

OT air sampling

- Air sampling should be done regularly:

- **Once a week** for OTs with a High-Efficiency Particulate Air (HEPA) filtered positive pressure ventilation system to monitor the efficacy of the system.(as applicable)
- **Once a month** for OTs without a ventilation system and whenever air is suspected as a source or transmission route of surgical site infection.

- **Procedure for sampling using the settle plate method:**
  1. Obtain the required number of culture media plates from the microbiology lab. Before taking samples, keep them outside the refrigerator for at least 30 minutes (they should be at room temperature when the sample is taken).
  2. Sampling should be done on an empty OT immediately after opening the OT in the morning.
  3. If OT swabs are to be taken at the same time, air sampling should be done before taking swab samples.
  4. The ventilation system/air conditioner should be turned on and allowed to run for at least 10 minutes with the OT closed and empty before sampling.
  5. The person performing the sampling should wear a sterile gown, sterile gloves, a cap, a mask, and OT dress and footwear before entering the OT.
  6. The culture plate should be labeled with the date, OT number, and sampling location before taking it into the OT.
  7. Expose one plate on the OT table for 40 minutes. This should be done aseptically without touching the culture media or contaminating the plate lid. The microbiology lab should train OT staff on this technique.
  8. After 40 minutes, the plates should be closed, sealed, and sent to the lab for further processing.

The lab should report the total colony counts after 24 hours of incubation at 37°C. The predominant type of growth, if any, should be identified and reported. The following results (both conditions together) will be considered satisfactory for an OT with a HEPA filtered positive pressure ventilation system:

- No growth of any organism.

No growth of any fungus, gram-negative organisms, or known pathogens such as *Staphylococcus aureus*

- If results are not satisfactory, investigation should be done, and appropriate corrective actions are needed to be taken.
- In case of unsatisfactory results:
  - Do not use the OT until the problem is resolved.
  - Monitor the cases operated since the last acceptable result onwards.
- Settle plate positivity rate pattern should be studied and used in the interpretation of test results in an individual set-up.
- Test reports should be informed to the hospital authorities and filed for records.

Surveillance of surgical site infection

Infection occurs within 30 days after the operation and involves only the skin and subcutaneous tissue of the incision, with at least one of the following:

- Purulent drainage with or without laboratory confirmation from the superficial incision.
- Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
- At least one of the following signs or symptoms of infection:
  - Pain or tenderness
  - Localized swelling
  - Redness or heat
  - Superficial incision is deliberately opened by the surgeon unless the incision is culture-negative.
- Diagnosis of superficial incisional SSI made by a surgeon or attending physician.

Deep incision surgical site infection

Infection occurs:

- Within 30 days after the operation if no implant is left in place.
- Infection involves deep soft tissue (e.g., fascia, muscle) of the incision and at least one of the following:
  - Purulent drainage from the deep incision but not from the organ/space component of the surgical site.
  - A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms:

        - Fever (>38°C)
        - Localized pain or tenderness
        - Unless the incision is culture-negative
    - An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
    - Diagnosis of deep incisional SSI made by a surgeon or attending physician.

Surgical site infection (SSI) monitoring

- All post-operative cases need to undergo physical inspection of the stitch lines and the surgical wounds by the concerned surgeon, and evidence of infection is recorded in the patient's case sheet/card.
- Surveillance for SSI should also be maintained in the OPD and dressing rooms, as many patients with surgical infections may present at follow-up.
- Culture swabs should be sent from suspicious cases as required for laboratory investigations.
- SSI reporting is done on the prescribed form.

Surveillance of hospital-associated respiratory infections

Hospital-associated respiratory tract infections can lead to nosocomial pneumonia and are one of the most serious HAIs. Nosocomial pneumonia is defined as a lower respiratory tract infection that appears during or after the hospitalization of a patient who was not incubating the infection on admission to the hospital.

The diagnostic criteria are:

- Fever, cough, development of purulent sputum
- Radiological changes showing progressive infiltration, and sputum gram-stain showing >25 WBCs per low field and bacteria.

Surveillance of urinary tract infections

Urinary Tract Infections are the most frequent nosocomial infections. A great majority of these infections are associated with an indwelling urethral catheter.

Definition:

An infection of the urinary tract that was not incubating at the time of admission.

Diagnostic Criteria:

- Clinical symptoms of fever, suprapubic tenderness, frequency, and dysuria.
- Presence of bacteria in the urine in significant quantity (more than 10^5 per ml).

Specimen for Culture:

Urine should be collected aseptically for culture by needle aspiration from the catheter. Catheter tips and specimens from urine bags are generally unsuitable for culture because the results are hard to interpret.

Criteria for surveillance of hospital acquired infections

Sl.no.	Type of HAI	Criteria
1	Surgical Site Infection(SSI)	Any purulent discharge, abscess, or spreading cellulitis at the surgical site during the month after the operation
2	Urinary Infection	Positive urine culture (1or2species) with at least 10^5bacteria/ ml, with or without clinical symptoms
3	Respiratory Infection	Respiratory symptoms with at least two of the following signs appearing during hospitalization:—cough—purulent sputum—new in filtrate on chest radiograph consistent with infection

Corrective and preventive action on reported hospital-acquired infections

- An effective surveillance system should identify priorities for preventive interventions and improvement in quality of care.
- By providing quality indicators, surveillance enables the Infection Control Programme, in collaboration with units, to improve practice and to define and monitor new prevention policies.

- Surveillance is a continuous process and needs to evaluate the impact of changes in practices and validate the prevention strategy to see if initial objectives are attained.

Calculation of HAI rate

SNo	Quality Indicator	Numerator	Denominator	Formula
1	Surgical site infection Rate	All Surgical site infection detected	All major & minor surgeries conducted	(Total number of observed surgical site infection*100/Total Number of surgeries done)
2	UTI Rate	Total number of UTI cases detected	Total catheter days	(Total number of UTI detected*1000/Total Catheter days)

Environment control

For the prevention of HAIs in the hospital, it must be ensured that proper environment control measures are taken by the organization. Environmental control measures help eliminate trigger factors that initiate hospital infections and reduce the conditions that sustain them. The minimum environmental measures that the hospital should follow include the following:

Layout of operation theatre & surgical suites

In OTs, a high degree of asepsis is to be ensured to provide an appropriate environment for staff and patients. For this, zoning of the OTs should be done to keep the theatres free from microorganisms. There may be four well-defined zones of varying degrees of cleanliness:

- Protective Area
- Clean Area
- Sterile Area
- Disposal Corridor

Protective zone:

Contains mostly theatre supply, changing rooms, examination room, and waiting area.

Clean zone:

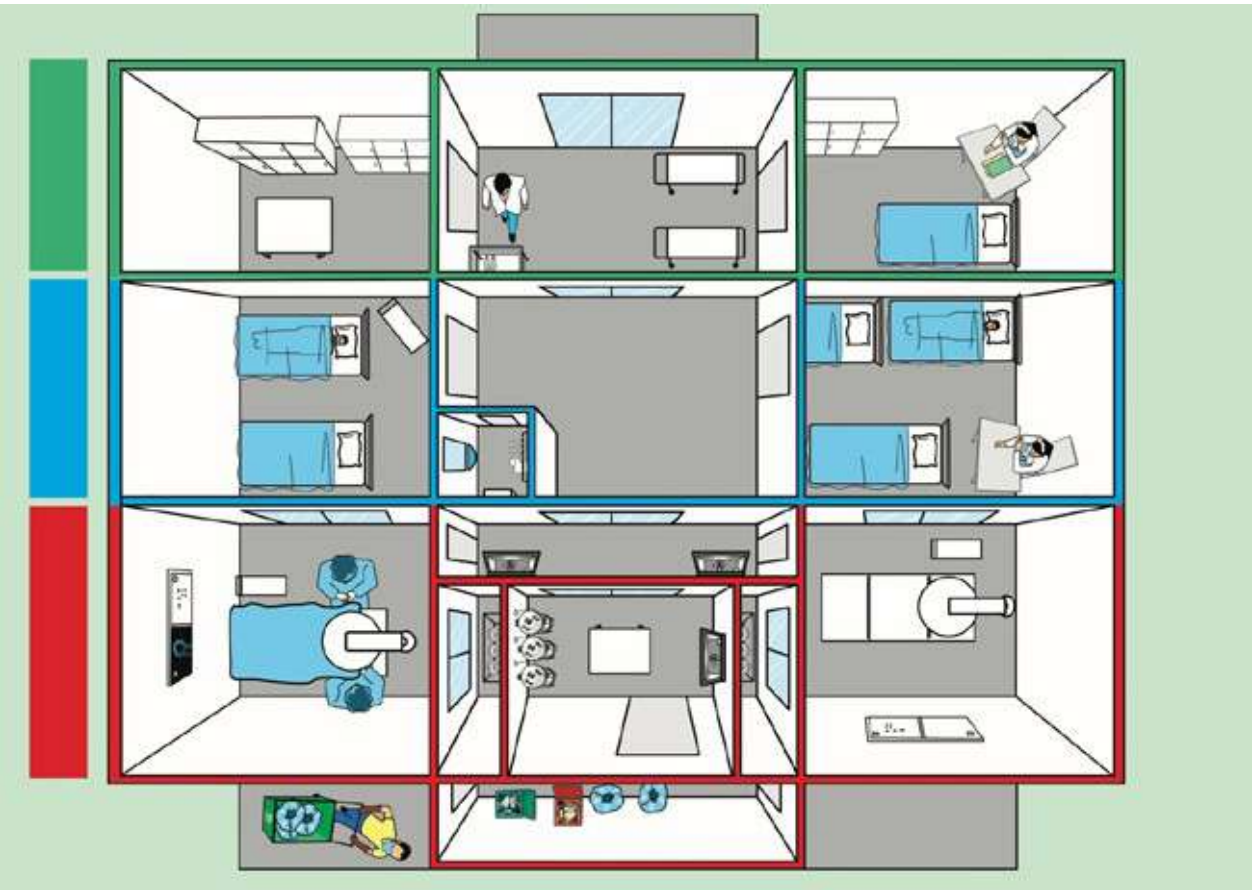
Includes the theatres, recovery room, theatre pack preparation, and pre-operative wards.

Aseptic or sterile zone:

Consists of scrub stations, operation theatres, and sterilizing rooms. This zone should provide the highest degree of antibacterial precautions.

Disposal or dirty zone:

Soiled instruments and dressings are transacted through this area for washing and re-sterilization or disposal. It includes the sluice rooms and disposal corridor.



Schematic diagram for zoning of operation theatre

Disinfection of OTs

Disinfection of OTs is categorized into two types:

1. **Disinfection of OT with HVAC system**
2. **Disinfection of OT without HVAC system**

Precautions while Fogging:

- Replace formalin with safer agents like "an aldehyde-based product containing Glutaraldehyde and chemically bound formaldehyde as principal disinfecting agents" (e.g., Bacillocid*).
- Advantages of these compounds:
  - Deep penetrating capability
  - No known resistant strains
  - Effective against Bacteria, Viruses, Mycobacteria, Amoeba, Fungi, and spore-forming organisms
- After fogging, conduct air sampling and maintain records.

Disinfection of OT with HVAC System

Fogging is not required for an OT with a HEPA-filtered positive pressure air supply system. However, before deciding not to fog such an OT, the following conditions must be met:

- The ventilation system design is appropriate and its performance is validated during installation and at least once a year. Records of validation should be available.
- Maintenance of the ventilation system is done at least once a year. HEPA filters are changed as per the manufacturer's recommendations or based on validation test results.
- Weekly air count monitoring using settle plates/air samplers is conducted, with results within acceptable limits and test reports available.
- Surface cleaning protocols are correctly implemented. OT cleaning staff should be well-trained.
- Adequate time is allocated for OT cleaning.

If any of the above are unsatisfactory or in doubt, fogging should be done.

General Steps for Fogging:

- Wear a gown, cap, mask, and utility gloves.
- Clean blood spills, remove waste, and disinfect surgical items.
- Inspect all OT surfaces for visible soiling/dust and clean with a high-level disinfectant (HLD).
- Wipe and clean all equipment, including OT tables, OT lights, trolleys, and anesthesia machines.
- Mop the floor twice with an HLD, starting from the farthest end of the OT and moving toward the door.
- Cover all electronic equipment with plastic covers to prevent fogged liquid from entering.
- Turn off the ventilation system.
- Fog the OT with "an aldehyde-based product containing Glutaraldehyde and chemically bound formaldehyde as principal disinfecting agents" (e.g., Bacillocid*). Stop fogging when the fog is visible in the air, exit the OT, and close it down.

Disinfection of OT without HVAC System

Procedure:

- After all para surgical cases, clean the OT as per standard cleaning protocols.
- Turn off the ventilation system (if present) and AC.
- Ensure all electronic equipment is wiped and covered with plastic.
- Prepare a solution of "an aldehyde-based product containing Glutaraldehyde and chemically bound formaldehyde" (e.g., Bacillocid*) in the fogger tank (as per manufacturer recommendations).
- Place the fogger in one corner of the OT, preferably near a door, on a trolley. Place a double-folded towel under the machine to prevent slipping.
- Direct the nozzle to the opposite corner of the room, elevated at 45 degrees.
- Start the fogger and close the OT.
- Allow the fogger to run until a fog is visible. Check through the door window.
- Once fog is suspended in the OT, wear a cap and mask, open the OT door, turn off the fogger, and remove it.
- Keep the OT closed for at least one hour** before use.

Note:

- Inspect the floor for wet patches after opening the OT. If wet, keep the OT closed until it dries naturally (turn on AC if available).
- If excess stickiness or white streaks are present, clean with soap and water. Adjust fogging solution dilution if necessary.
- Reduce fogging time by 1-2 minutes if stickiness persists.

Fogging of Wards/Rooms

Routine fogging of wards and rooms is unnecessary except in the following situations:

- After an isolation ward/room is emptied at the end of an outbreak.
- After an infected patient is discharged from a room (in the absence of an outbreak).
- When an outbreak occurs in a ward.

Steps for Cleaning and Fogging of Wards/Rooms:

- Wear cap, mask, gown, and utility gloves. Gather cleaning materials.
- Remove contaminated items, waste, linen, and instruments for cleaning.
- Change gloves and clean from periphery to center, moving from clean to unclean areas (top-down approach).
- After cleaning, close windows and doors, then fog the area using "an aldehyde-based product containing Glutaraldehyde and chemically bound formaldehyde" (e.g., Bacillocid*) until a visible fog is seen.
- Stop fogging, remove the fogger machine, and keep the area closed for at least one hour** before reuse.

Traffic flow in critical areas

- The layout should prevent the overlapping of general and patient traffic in critical areas like OT, Panchakarma theatre to minimize infection spread.
- OTs and panchakarma theatres should be located away from general traffic areas.
- The design should support zoning and ventilation standards in acute care areas.
- Clean and dirty corridors should not be adjacent and should ensure separate traffic flow of clean and dirty items.

SUPPORT SERVICES

Support services in the hospital play a major role in ensuring that they provide the defined services in an efficient manner and also enable the other staff of the hospital to carry on the activities required for patient care delivery. An engaged and integrated support service team has a significant effect on hospital services, allowing patients to heal quicker, promoting a safer environment, and improving the satisfaction of staff, patients, and families.

The contributions made by support service personnel in today's hospitals have become a crucial component of the organisation's success. Support service departments ensure that the hospital is clean, limiting the risk of infections; patient rooms are ready and available, improving throughput; food is nourishing and delicious, enhancing healing and well-being; linens are fresh, instilling trust and comfort; and equipment functions optimally, improving clinical diagnostics and outcomes.

The major support services areas covered under these guidelines include:

- Laundry services and linen management
- Water sanitation
- Kitchen services
- Security services
- Outsourced services management

Laundry services and linen management

The provision of clean linen is a fundamental requirement for patient care. Incorrect procedures for handling or processing linen can present an infection risk to both staff and patients. Hence, correct linen management is essential to prevent healthcare-associated infections (HAI) and ensure a hygienic hospital environment.

The term 'hospital linen' includes all linen used in the hospital, such as mattresses, pillow covers, blankets, bed sheets, towels, screens, curtains, doctors' coats, theatre clothes, and tablecloths. The hospital receives these materials from various areas, including the OT, wards, outpatient departments, and office spaces.

Estimation of stock of linen needed by the hospital

Hospitals must ensure they have sufficient stock of linen (including reserve) readily available for all areas. Different types of linen needed in the hospital include:

- General Purpose Linen: Includes items not directly used for patient care, such as curtains, drapes, and tablecloths.
- Patient Linen: Comprises clothing worn by patients, including pajamas, shirts, gowns, and coats.
- Bed Linen: Includes bed sheets, pillow covers, and blankets used by patients.
- OT, Procedure Room Linen: Includes items like pajamas, kurtas, gowns, coats, shirts for surgeons, and OT personnel, along with surgical gowns, caps, masks, trolley covers, and OT towels.

Number of Linen Sets

Hospitals should ideally have at least four sets of linen per day, though six sets are preferable. The classification of six sets of linen is as follows:

- One in use (on the bed)
- One ready to use (in sub-store)
- One in transit (route to laundry or ward)
- One in the washing cycle (in laundry)
- Two in stock (in the central store)

In an ideal scenario, for a 100-bedded hospital, 600 bed sheets are required. Hospitals must maintain a linen stock register to keep track of available linen in the central store or under the laundry in-charge.

General instructions for laundry management

Linen

The basic principles of linen management are as follows:

- Place used linen in appropriate bags at the point of generation.
- Contain linen soiled with body substances or other fluids within suitable impermeable bags and close the bags securely for transportation to avoid any spills or drips of blood, body fluids, secretions, or excretions.

- Do not rinse or sort linen in patient care areas (sort in appropriate areas).
- Handle all linen with minimum agitation to avoid aerosolization of pathogenic microorganisms.
- Separate clean from soiled linen and transport/store separately.
- Wash used linen (sheets, cotton blankets) in hot water (70°C to 80°C) and detergent, rinse, and dry preferably in a dryer or in the sun.
- Autoclave linen before being supplied to the operating rooms/theatres.
- Wash woolen blankets in warm water and dry in the sun, in dryers at cool temperatures, or dry-clean.

Bedding

- Mattresses and pillows with plastic covers should be wiped over with a neutral detergent.
- Mattresses without plastic covers should be steam cleaned if they have been contaminated with body fluids. If this is not possible, contamination should be removed by manual washing, ensuring adequate personnel and environmental protection.
- Wash pillows either by using the standard laundering procedure described above or dry clean if contaminated with body fluids.

Classification of linen

For laundry purposes ,linen in the hospital is classified into two categories:

Dirty Linen	Soiled Linen
Dirty linen is used linen, but not visibly soiled with blood or blood tinged body secretions.	Soiled linen is known, or potentially, infected / infested linen. All linen which is contaminated with excreta, blood or body fluids or contaminated linen from a patient who is known or clinically suspected, to be infected with diseases like salmonella, Hepatitis A,B or C, open pulmonary tuberculosis, HIV etc.

Process of linen management in the hospital

Labeling of linen

All linen being used in hospitals needs to be labelled for identification and traceability. Proper labelling of the linen also helps in proper inventory management. The label of the linen includes the following minimum details:

- Name of the hospital (XYZ)
- Name of the Department or Number of Ward
- Type of linen like Bed Sheets (BS), Patient Gown (PG), Pillow Cover (PC)
- Number of linen i.e. 1, 2, 3…
- Doctors' coats labelled with the Doctor's name

For example, bed sheets used in the ICU of a hospital can be labelled as: XYZ/OT/BS/1, similarly, a bed sheet in general ward 1 can be labelled as: XYZ/GW1/BS/06

Colour coded bags for segregation of linen at the source

Linen collection and segregation

- The hospital should have a fixed schedule for the collection of linen from different areas of the hospital.
- All patient linen, including bed sheets and patient gowns, needs to be changed daily.
- All linen in critical areas like needs to be changed daily.
- Staff linen needs to be changed on a weekly basis.
- It is strongly recommended to change all linen used in the hospital when visibly dirty or soiled.
- While collecting linen, care should be taken to ensure all sharps or patient equipment are removed.
- Staff should wear appropriate PPE like heavy-duty gloves, aprons, and masks during linen handling. Any skin lesions on hands should be covered.
- Hand hygiene should be practiced after linen handling.
- Linen needs to be collected in bags and trolleys and should not be placed on the floor or any other surfaces.
- All linen generated from patient care areas should be segregated into dirty and infected linen. Linen from different hospital areas needs to be collected in different color-coded trolleys.
- To minimize aerosolization of organisms contaminating linen, it should not be rinsed, shaken, or sorted in the clinical area. Personnel should keep their hands away from their face while handling linen.
- The collected linen needs to be stored at a designated place, i.e., in the dirty utility of the area where it was generated.
- The attendant/sister in charge of the area needs to update the daily transaction register every time linen is collected from the area. The transaction register should include details of the number and types of linen items collected from that particular area. A separate register should be maintained in different areas for the same purpose.

Transportation of linen

- Linen collected from different areas of the hospital needs to be transported in covered trolleys to the laundry.
- Dirty and soiled linen must be transported in separate trolleys.
- A dedicated trolley for linen transportation should be used; trolleys meant for waste collection or other purposes should not be used.
- During transportation, it must be ensured that the bags used for linen collection are properly tied.
- In case of any spillage of soiled linen during transport, the linen should be securely placed in the transportation trolley, and the surface should be cleaned as per the hospital's spill management protocol.

Receiving in the laundry

- The person responsible for receiving linen in the laundry must enter the details in the receiving and distribution register.
- The details should include the type and quantity of linen received, the department from which it was received, and the date and time of receipt.
- Maintaining records ensures quality assurance in linen and laundry management.

Disinfection and sluicing

- The first step in processing soiled linen is disinfection and sluicing.
- All infected linen must be soaked in a 0.5% bleaching solution for 30 minutes, followed by thorough rinsing with plain water to remove the bleach.
- The linen is then handed over for washing.
- If laundry services are outsourced, the hospital is responsible for disinfecting and sluicing soiled linen within the facility before handing it over to the outsourced agency or personnel for further processing.

Washing

Washing by Hand

- **Step 1**: Wash heavily soiled/infected linen separately from non-soiled linen.
- **Step 2**: Wash the entire item in water with liquid soap to remove all soilage, even if not visible.

Remember:

  - Pre-soak in soap, water, and bleach ONLY if linen is soiled.
  - Use warm water if available.
  - Add bleach (for example, 30–60 ml [about 2–3 tablespoons] of a 5% chlorine solution) to aid cleaning and bactericidal action.

    - Add sour (a mild acid agent) to prevent yellowing of linen, if desirable.
- **Step 3**: Check the item for cleanliness. Rewash if it is dirty or stained.
- **Step 4**: Rinse the item with clean water.

Machine Washing

- **Step 1**: Wash heavily soiled linen separately from non-soiled linen.
- **Step 2**: Adjust the temperature and time cycle of the machine according to manufacturer's instructions and the type of soap or other washing product being used.
- **Step 3**: When the wash cycle is complete, check the linen for cleanliness. Rewash if it is dirty or stained. (Heavily soiled linen may require two wash cycles.)

Dirty Linen

- Dirty linen (non-infected linen) is to be washed in the first batch, with plain water and detergent.
- Use of hot water with temperature > 71°C is recommended.

Soiled & Infected Linen

- Infected linen is defined as linen derived from known infectious patients, including those with HIV, Hepatitis B, C, and other infectious agents.
- After sluicing, the infected linen is treated with hot water and detergent at a temperature of more than 71°C with a minimum wash cycle of 25 minutes.

Hydro Extracting and Drying

- Washed linen is put in the mechanised hydro-extractor for extraction of water from the processed linen.
- If the hospital does not have the facility of hydro-extracting, the linen can be put to air dry in direct sunlight.
- During the drying process, ensure that the linen is kept off the ground and away from dust exposure.

Repair of linen (if necessary)

- All linen is checked for any damage, wear, and tear.
- In case of any damage, such as a minor hole or tear, it should be sent for repair and mending.
- If the linen is severely damaged and cannot be repaired, it can be discarded or condemned as per the hospital condemnation policy, by the laundry supervisor.

Calendaring and ironing

- Bed sheets and other heavy linen need to be calendered with mechanized calendering machines installed at the hospital.
- If the hospital does not have the facility of calendering machines, the linen needs to be ironed using a flat work iron and folded properly.

Delivery of clean linen

- The processed linen is transported in a clean, covered trolley to the central store.
- It is to be ensured that the storage of clean linen before distribution is separate from dirty linen.
- From the central store, the clean linen is issued to respective departments based on the indent generated from the departments.
- From the central store, the linen is distributed to respective departments in clean trolleys.
- A record of issued linen needs to be updated in the central store room, while the respective departments need to update the transaction register with the details of linen received in the department.

Bedding

- Mattresses and pillows with plastic covers should be wiped over with disinfectant such as 70% alcohol or 1% chlorine solutions.
- Mattresses and pillow covers without plastic covers should be washed with water and detergent and left for air drying after the discharge of every patient, or on a weekly basis if occupied by the same patient.
- Blankets may be dry cleaned or hand washed. It can be done by soaking for 15 minutes in lukewarm water. Then soap suds are squeezed through the blanket and rinsed in cold water at least twice. The blanket should not be twisted or wrung. It should be dried by spreading on a clean surface.

Responsibility of linen management

- Change of Linen: Staff Nurse/Ward Attendant
- Sorting and Storing of Used Linen: Ward Attendant/Housekeeping Staff
- Disinfection of Soiled/Infected Linen: Housekeeping/Laundry Staff
- Collection of Used/Soiled Linen: Laundry Staff
- Counting of Collected Linen: Laundry Staff/Nursing In-charge
- Transporting Dirty Linen: Laundry Staff

- Washing, Drying, and Ironing: Laundry Staff
- Receipt of Washed Linen in Departments: Nursing In-charge
- Storage and Issue of Washed Linen: Nurse In-charge

Do's and don'ts for Linen Management

Do's	Don'ts
Arack for keeping used and ready to use linen should be available close to the point of use	Carry used linen close to the body
Sharps to be removed from the linen	Drop linen on the floor
Appropriate tagging and labeling of linen bags	Shaking linen as thiswillresultinthedispersal of potentially pathogenic micro-organisms
Decontaminating hands immediately following removal of PPE after handling used linen and before handling clean linen	Over filling of used linen bags
A disposable plastic apron should always be worn when handling used linen and disposable gloves should be worn where linen is soiled/foul.	Linen bags containing used linen stored in corridors (should be keep in a separate designated area) Storing clean and used linen in the same area.

Records

List of files and registers to be maintained for linen management in the hospital:

- Linen stock register at the central store
- Area-wise daily transaction register
- Laundry and linen receiving register and distribution register at the laundry

Water sanitation

- The availability of adequate water, sanitation, and hygiene services are essential components of providing basic healthcare services in healthcare facilities.
- In healthcare facilities, the availability of clean drinking water is one of the major components contributing to patient safety. Hence, water sanitation is inevitable in health facilities for better patient care.
- In order to ensure better healthcare services in relation to water sanitation in healthcare facilities, it is essential to ensure that hospitals have an adequate supply of water, with proper storage facilities, and that the quality of the water supplied is guaranteed.

Water requirement in the hospital

- The use of water in hospitals is not limited to cleaning or drinking purposes but is also needed for carrying out other important functions in various departments such as sterilization and disinfection, kitchen, radiology (film processing), analytical labs, pure water systems, laundry, gardening, firefighting, etc. Thus, for the continuation of basic services in hospitals and ensuring safe patient care, an uninterrupted supply of water is a prerequisite. Hospitals need to calculate the water requirements of the facility and plan accordingly.

As per BIS the water requirement in the hospital is as follows:

Type of Facility	Water Requirement
Bed Strength :Not exceeding 100	340 lt/bed/day
Bed Strength : Exceeding 100	400 lt/bed/day

The water requirement for hospitals with a bed strength not exceeding 100 should be at least 340 liters per bed per day. For hospitals with a bed strength exceeding 100, the requirement is 400 liters per bed per day. The water requirement of hospitals should be calculated as described. It must be ensured by the hospital that water is available on a 24x7 basis and is readily accessible at all points of use. Any interruption in the continuous supply of water must be immediately addressed to ensure an uninterrupted supply at the place of work. It should be noted that this water requirement does not include the water needed for fire safety.

Storage of water

- Water supply in the hospital, as per requirements listed above, needs to be stored in an appropriate manner in overhead tanks or underground tanks required in case of fire emergencies in the hospital.
- The storage tanks need to have the capacity to store up to 48 hours of water requirement of the hospital
- The storage tanks need to be covered with an appropriate sealed lid and must be under lock and key, under the jurisdiction of a dedicated person of the hospital.
- It is recommended that while planning the storage tanks, the ease of cleaning should be kept under consideration.

Ensuring the quality of water

water testing

Since water is used extensively for drinking, cleaning, and disinfection purposes all over the hospital, the quality of supplied water becomes very critical.

Physical Testing of Water

- Physical testing for hardness, total dissolved solids (TDS), and other parameters needs to be done at least once a year on samples obtained directly from the source (e.g., well water and bore water).
- Testing should also be repeated if the source of water changes (e.g., a new borewell is made or major repairs/cleaning is done on the existing source, e.g., well is cleaned/disinfected).
- Physical testing is not required if municipal/corporation water supply is used for all purposes at all times.

Microbiological Testing of Water

- Water used for cleaning and disinfection needs to be tested microbiologically by methods that will allow growth of waterborne organisms. Standard microbiology protocols are to be followed for the testing.
- Microbial testing of water at a given location should be done every three months and additionally when the source is changed, major repairs are done on the supply system, or a water-related outbreak of infection is suspected.
- Generally, the following samples should be obtained at a minimum:
    - OT scrub basin tap (any one tap)
    - Hand wash basin tap in a ward that caters to the maximum number of patients
    - All Drinking water sources

The samples should show the absence of coliform organisms. If water contamination is observed, investigate for possible water contamination. The supply source and system should be checked (and disinfected if required).
For ensuring the quality of water being supplied in the hospital, the following minimum listed interventions are needed to be carried out by the hospital:

Step 1: Cleaning Of Storage Tanks

Water storage tanks need to be manually cleaned to remove any residual debris or unwanted growth of flora or fauna. The hospital must keep records of tank cleaning to prove compliance.

- All overhead tanks must be manually cleaned at least every six months.
- The date of the water tank cleaning should be written on the tank for easy visibility and to help remember the next cleaning schedule.
- It is recommended that tanks which were previously used but have been out of use for a while should also be cleaned and disinfected.

Steps for Cleaning:

1. Open the outlet valve or tap and drain out any remaining liquid.
2. Permanent storage tanks are typically fitted with a washout valve at the base. Use this valve, rather than the normal outlet valve, to empty the tank.
3. Use a mixture of detergent and hot water (household laundry soap powder can be used) to scrub and clean all internal surfaces of the tank. This can be done with a stiff brush or high-pressure jet. Attaching the brush to a long pole can help clean the tank without entering it.
4. Drain all the water from the tank and collect it for safe disposal. Continue flushing the tank until no detergent traces remain in the water.

5. Clean the pumps and pipes used for filling and emptying the tank by flushing them with a hot water and detergent mixture to remove deposits and waste material. Once cleaned, flush the system with clean water to remove the detergent.

Step 2: Disinfection of Water Tanks

The most common method of disinfecting a water tank is chlorination. Chlorination involves adding chlorine to drinking water to disinfect it and kill germs. It helps neutralize microorganisms in the water, reducing the transmission of diseases in the community or health facility. Drinking water with small amounts of chlorine is safe and offers protection against waterborne disease outbreaks. Chlorine is commonly delivered as high-strength calcium hypochlorite (HSCH), which releases 60 to 80% of its volume as chlorine when mixed with water.

Steps for Disinfection:

1. Add the disinfectant: Fill the tank a quarter full with clean water.
2. Sprinkle 80 grams of granular HSCH into the tank for every 1000 liters of the tank's total capacity.
3. Fill the tank completely with clean water, close the lid, and leave it to stand for 24 hours.
4. If the tank is needed urgently, double the amount of chlorine added to the tank, reducing the disinfection time from 24 hours to 8 hours.
5. Wash and flush the tank. This can be easily done with a high-pressure hose or water jet. If unavailable, fill the tank with (preferably hot) water and leave it for a few hours.
6. Prepare the tank for use: Completely empty the tank and carefully dispose of the disinfecting water, as it contains a high concentration of chlorine.
7. Fill the tank with drinking water, allow it to stand for about 30 minutes, then empty the tank again.
8. The tank is now ready for use.

Step 3: Testing Of Water Quality

Testing of Free Chlorine

- The presence of chlorine residual in drinking water indicates that:
    - A sufficient amount of chlorine was added initially to the water to inactivate the bacteria and some viruses that cause diarrheal disease; and,
    - The water is protected from recontamination during storage.
- The presence of free residual chlorine in drinking water is correlated with the absence of disease-causing organisms, and thus is a measure of the potability of water.
- Hospitals need to carry out testing for the presence of free chlorine at 0.2 ppm.
- Testing needs to be carried out at regular intervals from the samples drawn from potable water, and records of the same need to be maintained for proving compliance.

Microbiological Surveillance of Water

- Hospitals need to carry out microbiological surveillance of the water, drawing samples from overhead tanks and from drinking water facilities.
- Records of this surveillance need to be kept for proving compliance.

Quantity of chemicals needed to disinfect water for drinking

Water(m^3)	BleachingPowder (25-35%) (g)	High Strength Calcium Hypochlorite(70%)(g)	Liquid Bleach (5%sodiumhypochlorite) (ml)
1	2.3	1	14
1.2	3	1.2	17
1.5	3.5	1.5	21
2	5	2	28
2.5	6	2.5	35
3	7	3	42
4	9	4	56
5	12	5	70
6	14	6	84
7	16	7	98
8	19	8	110

10	23	10	140
12	28	12	170
15	35	15	210
20	50	20	280
30	70	30	420
40	90	40	560
50	120	50	700
60	140	60	840
70	160	70	980
80	190	80	1100
100	230	100	1400
120	280	120	1700
150	350	150	2100
200	470	200	2800
250	580	250	3500
300	700	300	4200
400	940	400	5600
500	1170	500	7000

Bacteriological Quality of drinking water

Organism	Guideline Value
All water intended for drinking	
E.Coli or thermo tolerant coli form bacteria[b]	Should not be detectable in any 100ml sample
Treated water entering the distribution system	
E.Coli or thermo tolerant coliform bacteria[b]	Should not be detectable in any100ml sample
Total colifom bacteria	Should not be detectable in any 100ml sample. In case of large supplies, where sufficient samples are examined, should not be present in 95% of samples taken throughout any 12-month period
a. Immediate investigative action should be taken if either E. Coli or total coliform bacteria are detected. The minimum action in case of total coliform bacteria is repeat sampling; are these bacteria detected in the repeat sample, the cause should be determined by immediate further investigation Although E. Coli is the more precise indicator of faecal pollution, the count of thermo tolerant coliform is an acceptable alternative. If necessary, proper confirmatory tests need to be carried out. Total coliform bacteria are not acceptable indicators of the sanitary quality in rural water supplies, particularly in tropical area where many bacteria of no sanitary significance occur in almost all untreated supplies	

Kitchen services

The kitchen serves as one of the most important support service departments in the hospital, aiding in the rapid recovery of patients by providing food according to their specific requirements. However, kitchen establishments are also identified as places that may lead to outbreaks of food-borne infections. The quality and quantity of food play a crucial role in patient recovery, and ensuring safe food delivery is a critical aspect of healthcare services. Hospital patients may be more susceptible to food-borne infections and suffer more serious consequences than healthy individuals. Therefore, high standards of food hygiene should be maintained throughout the service delivery. The need for adequate food hygiene facilities is of paramount importance in kitchen services. Assuring safe food requires the management and control of microbiological, chemical, and physical hazards.

To maintain proper hygiene and an infection-free environment in the kitchen services department, the following minimum interventions need to be carried out when planning or executing the kitchen or dietary services in healthcare settings.

Location of the kitchen department

- The kitchen department should ideally be located away from patient care areas, preferably in a separate building if feasible.
- It is preferable for the kitchen to be located on the ground floor, allowing easy accessibility for receiving raw materials and distributing food via food trolleys.
- The location should be such that any noise or cooking odors emanating from the department do not cause inconvenience to other departments.
- The location should also minimize the time required to deliver food to the wards.

General layout and requirements

- The kitchen area should be physically separate from patient care areas and located away from the biomedical waste collection/disposal area.
- The kitchen complex should contain, at the minimum, the following physically separate areas:
    - Raw supply receiving and checking area
    - Separate room for storage of raw material and vegetables with appropriate numbers of refrigerators, racks, etc.
    - The kitchen itself should have defined areas for:
        - Processing raw food (washing, cutting vegetables, etc.)
        - Cooking (where food is actually cooked)
        - Holding cooked food
        - Dispensing counter/area
    - Separate area to temporarily hold waste from the kitchen
    - Separate area to store cleaning equipment (e.g., mops, buckets, and cleaning chemicals). This should not be connected to the storage area in any manner (open door/window).
    - A dedicated toilet for use by kitchen staff
- Adequate supply of treated water should be ensured at all times. If borewell/well water is used, there should be a provision for disinfection using chlorine or boiling before use.
- Windows should be fitted with mesh screens to prevent the entry of insects, lizards, etc.
- All food grain storage should be done on raised pallets/stands with a minimum clearance of 8-12 inches from the floor. Pallets should ideally be made of metal as wooden ones are not easy to clean. All refrigerators, freezers, and other floor-based equipment should have the same clearance above the floor.
- Storage pallets and refrigerators should have clearance from all sides to enable inspection and cleaning.
- The storage room should not have a high temperature. An air conditioner (AC) should be installed if possible. An exhaust fan should be installed if an AC is not available. The windows should be kept closed at all times. A thermometer to measure room temperature should be available in the room, and a daily log of the same should be maintained.
- The storage room should have smooth internal surfaces without cracks and crevices in the walls or floor.

Separation of Cooked and Raw Food

- Separation of cooked and raw food should be maintained at all locations. Holding/storage areas for the two should be separate from each other.

Hand Hygiene and Food Preparation

- Hand wash basins should be available in the food preparation area. These should be separate from the basin used to wash raw food.
- Alcohol hand rub should be available in the food preparation area.

Ventilation and Equipment

- Adequate ventilation should be provided. Exhaust fans should be available in the cooking area to exhaust the hot air generated by stoves.
- Weighing/measuring apparatus for raw and clean/cooked foods should be separate (e.g., different jugs should be used to measure raw milk and heated milk).

General cleaning of environment

- Separate mops, buckets, and cleaning chemical supplies should be used for the kitchen.
- All floors in the kitchen complex should be cleaned at least twice a day using soap and water. Cleaning should begin with the food storage room and proceed to the preparation and cooking areas. The waste

storage area and the cleaning equipment storage area should be cleaned last (clean to dirty sequence should be followed).

- Additional cleaning should be done as and when required; for example, spills should be cleaned immediately. If the floor appears dirty, it should be cleaned immediately.
- Food storage pallets should be cleaned by wiping with soap and water at least weekly.
- Equipment such as tables and food preparation and holding counters should be wiped with a chlorine solution containing 500 ppm of chlorine (1% dilution of hypochlorite) at least twice a day or before and after food preparation, whichever is suitable. The solution should remain wet on the surfaces for at least one minute.
- Weighing machines used to weigh raw material should be cleaned once a day and whenever soiled, by wiping/washing with soap and water.
- Cooking stoves should be wiped clean with soap water before and after use. They should always appear clean. Cooking gas cylinders attached to the gas stove should also be wiped with soap and water once a day.
- Mop heads, mops, and brushes should be changed when they become frayed or at least every two weeks, whichever is earlier. Clean with soap and water before the next use.

Cleaning of items used to handle food

- Equipment that comes in contact with food – cutting boards, knives, mixing utensils, cooking utensils, serving plates and bowls, glasses, etc. – should be washed with soap and hot water (if available) and then immersed in a chlorine solution containing at least 250 ppm chlorine (0.5% dilution of hypochlorite) for at least one minute. Do not use hot water to prepare chlorine solutions. After immersion, rinse with plain water immediately and allow to dry naturally before use.
- Cleaning of these items should be done before the first use of the day. During the day, these items should be washed with soap water after use and whenever they appear soiled/dirty.
- When not in use, store these items in a closed cupboard or container. For example, all knives and spoons should be cleaned at the end of the day, dried, and stored in a closed plastic box until the next morning. Utensils should be stored in closed cupboards or covered with a plastic sheet.

Hygiene and Medical Examination of Food Handlers

- All persons handling food will undergo periodic medical examination and laboratory testing at the following times:
    - Initially before joining the job
    - Subsequent medical examinations should be done as under:
        - Complete physical exam – once a year
        - Stool examination for ova, cysts, and parasites – every three months
        - Stool culture for salmonella – every three months
        - Routine complete blood counts (CBC) – every three months
        - Other investigations such as chest x-ray, Widal test, stool culture for cholera, etc., should be done as and when required based on the findings of routine testing or reported symptoms
        - Testing frequency of relevant tests should be increased during an outbreak of diarrheal disease
        - All food handlers should be vaccinated against Hepatitis B, salmonella, and cholera.

Hygiene Rules for Kitchen Workers

- Fresh washed clothes are worn every day
- Hair is kept short or tied in a bun in the case of females. Loose hair should not be allowed in the kitchen under any circumstances. Male employees should preferably be clean-shaven. If beards are grown, they should be properly maintained.
- Netted cap covering all head hair will be worn by all kitchen workers on duty
- Nails will be kept short and clean
- Hand jewellery will not be worn while on duty
- Apron should be worn when handling food
- Hand washing should be done:
    - On joining duty
    - After completing a task (e.g., vegetable cutting, cooking the food, etc.)
    - Whenever the hands are visibly dirty/soiled

    - After using the washrooms, after eating food, and before leaving duty
- Hands should be disinfected using an alcohol hand rub:
    - Before handling raw food
    - Before beginning cooking
    - Before dispensing cooked food
    - After washing utensils
    - Before leaving duty
- Any illness should be promptly reported, and the worker should undergo appropriate examination and take the recommended treatment without delay.

Receipt and Storage of Raw Food

- Raw food supplies should be checked for contamination in the receiving area before being taken to the storage area.
- Gross dirt should be removed by washing foods such as potatoes and fruits before storage.
- Boxes should be wiped with soap and water to remove external dirt before being taken to the storage area. Excessive water should not be applied.
- Only clean food supplies should be taken to the storage area.
- Grains should be stored in closed containers on raised pallets. Containers should be washed and dried before they are refilled with grains. Grains requiring aerated storage may be stored in clean jute bags with the mouth securely tied.
- Vegetables and fruits should be stored in the refrigerator at 2-4°C temperature.
- Excessive stocking of perishable items such as bread and eggs should be avoided.
- The storage room should be maintained dry and clean at all times.
- Cooked food should never be stored in the storage room.
- Monitor for pests on a daily basis and report immediately if seen.

Cleaning and Disinfection of Vegetables before Use

- Wash vegetables and fruits in running plain water of drinking quality.
- Remove damaged/bruised areas of leafy vegetables. Do not cut open fruits or potatoes before disinfection.
- Immerse in a chlorine solution containing 200 ppm chlorine (can be prepared by making a 0.5% dilution of hypochlorite solution or using chlorine tablets/powders as recommended by the manufacturer). Immerse for one minute for proper disinfection.
- Immediately after this, rinse with plain water to remove all residual chlorine.
- Drip dry or wipe dry as suitable and transfer to the food preparation area immediately. Cleaned food should not be left in the washing area.

Processing of Raw Food for Cooking

- Preliminary preparation of the food should be done in a designated area of the kitchen.
- Wash and disinfect hands before handling the food.
- Ensure cutting boards, knives, other containers, and countertops are clean.
- Use separate knives and cutting boards for vegetables and fruits.
- Take up the prepared raw food for cooking/serving as soon as possible. Avoid storing and using later as much as possible.

Food Preparation

- Wash hands with soap and water before beginning cooking.
- Ensure all utensils and other equipment are clean before beginning.
- Use a clean container/measuring apparatus to measure out food portions.
- Use correct temperatures for cooking the food.
- Cook eggs until the yolk and white are firm.
- Cooked and raw food should be kept separate (e.g., use different counters for each).
- Food should not be consumed in the preparation area.

Storage and Dispensing of Prepared Food

- Prepared food should be kept covered and served as soon as possible.
- Wear clear plastic gloves when dispensing food.
- Plates, glasses, ladles, cups, etc., used to handle cooked food should be clean. Inspect visually before using.

Refrigerators

- Monitor the temperature of all refrigerators by placing a thermometer/temperature monitor inside them and record the readings at least once daily. The temperature should be maintained between 2-4°C. Electronic sensors may be used, if available.
- Place refrigerators away from heat sources and keep clearance at the back of the unit to allow hot air to escape.
- The following cleaning procedure should be used to clean all refrigerators:
  - ✓ Switch off the unit and remove all food items, ensuring that these are covered in the appropriate manner and are kept safe during the cleaning process.
  - ✓ Remove all shelves and scrub clean with soap and water.
  - ✓ Clean the fridge walls and base in that order with soap and water.
  - ✓ Remove all condensation from drip/chiller trays (if applicable) and wipe down all inner walls with a clean cloth.
  - ✓ Replace all shelves and switch on the unit.

Waste disposal:

- Kitchen waste should be segregated into dry and wet at the point of generation.
- Wet waste should be collected in waterproof bags. This waste can be used for composting.
- Waste bags should be tied and disposed of each evening or when three-fourths full, whichever is earlier.
- Kitchen waste should not be mixed with biomedical waste.

Pest control :

- The entire kitchen area should be sprayed with pesticides every three months and whenever large numbers of pests are detected.
- Rodent traps should be placed in various areas and checked daily.
- Pest infestation should be looked for daily and reported immediately when detected.

Hospital security services

Hospital security services are of vital importance, as hospitals are public-facing organizations visited by thousands of people every day. It is very difficult to anticipate the intentions of antisocial elements, and checking visitors without offending their sentiments can be a challenge. Each hospital should have Safety and Security Management protocols in place, which describe processes designed to eliminate or reduce, to the extent possible, hazards in the physical environment and to manage staff activities, aiming to reduce the risk of injuries to individuals and loss of property.

In relation to the maintenance of cleanliness and hygiene, security services in the hospital need to perform the following functions:

Dressing and behaviour of security staff

- All security staff should be dressed meticulously as per the hospital's dress code.
- Smoking, drinking, or chewing tobacco should be prohibited while on duty.
- Security personnel should exhibit compassionate and appropriate behaviour within the facility.
- Hospital security services should be trained in crowd management and handling agitated patients and visitors.
- Security services should be equipped with a communication system for use in emergencies and to sound alarms if necessary.

Guarding of critical gateways

The hospital must ensure that all main entrances are guarded by security personnel. Locations where security is necessary to check nuisance and unauthorized entry include:

- Main entrance of the hospital
- Wards
- OT
- Emergency
- Waiting areas

Crowd management

Crowd management in the hospital is one of the critical functions performed by the security personnel. The hospital environment is often stressful for most visitors, making efficient crowd management necessary to ensure the safety of staff and the environment.

- For efficient crowd management, security personnel should maintain a professional manner and remain neutral in both words and deeds, even in the face of antisocial behavior from the crowd.
- Security personnel need to proactively and repeatedly attempt to establish and maintain communication and cooperation with representatives of the agitated crowd or individuals.
- Security personnel should supervise the availability of patient amenities in the waiting areas of the facility, as the unavailability of these amenities is a major factor for discontent among visitors.
- Security personnel must ensure that the patient calling system is followed in the OPD area through proper queue management.
- Security personnel are also responsible for visitor management as per the hospital's visiting hours policy.

Vigilance and reprimand activity

Vigilance activity:

In addition to ensuring safety in the hospital, security personnel are also required to carry out vigilance activities concerning hygiene, sanitation, and cleanliness within the health facility.

- Security personnel should patrol all important and sensitive areas of the premises as specified by the hospital, checking and blocking access to loitering or unlawful persons and vagabonds.
- Guards on duty should monitor vehicles, scooters, motorcycles, and bicycles parked in designated areas within the hospital premises, ensuring they are parked correctly and do not block access pathways.
- Security personnel should remain vigilant for any stray animals within the premises.
- They must ensure that flower plants, trees, and grassy lawns are not damaged by staff, outsiders, or stray cattle.
- They should maintain a strict watch over suspicious-looking persons or objects and take immediate action as deemed appropriate.
- Security personnel should also ensure that no person, including staff, visitors, or patients, engages in unhygienic behavior such as littering, spitting, or open urination and defecation.
- Unauthorized vendors or ragpickers should be restricted from entering the campus.
- Hospital security services should also ensure the central waste storage area is secured.

Reprimand Activity

- Hospital security services should be empowered with the authority to reprimand anyone involved in unhygienic behavior within the hospital.
- The reprimand authority should be clearly defined by the hospital administration.

Outsourced services management

There are two facets to service delivery in a health facility: the Cure and the Care parts. "The Cure" part refers to the services offered by the medical team for the diagnosis and treatment of the ailment, whereas "the Care" part pertains to the hospitality services within the hospital provided by non-medical and skilled/semiskilled/unskilled employees. Many hospitals prefer to outsource their care services, such as security, housekeeping, and laundry, to external agencies. This is because creating infrastructure to render these services and, most importantly, managing manpower and regulating absenteeism, unavailability, and potential legal issues can be challenging. Therefore, hospitals today prefer focusing on medical care and the latest technology while offloading ancillary services to experienced facility management agencies.

With outsourcing, an external contractor assumes responsibility for managing one or more of a healthcare organisation’s business or services. Because the contractor specializes in providing a specific service and can achieve economies of scale, they may be able to provide the service more efficiently and at a lower cost than the healthcare organisation.

Types of Outsourcing Services in Hospitals

- Outsourcing of non-clinical services: such as security, housekeeping, laundry, janitorial, and security services.
- Outsourcing of specialized healthcare services: such as diagnostics and laboratory.

While outsourcing services, hospitals need to ensure the following minimum requirements:

- ✓ **Valid agreement/contract with outsourced agency**
  - Hospitals should evaluate services to be outsourced based on the hospital's needs. They must independently assess the extent of service required, including the number of personnel, timing of service, deliverables, etc.
  - A committee should be formed to detail the request for proposal and design measurable tools to monitor and evaluate the performance of the outsourced agency.
  - Hospitals must have a valid agreement with the outsourced agency for any services being outsourced.
  - A formal agreement/contract must be signed between both the hospital and the outsourced agency, covering all the requirements to ensure that services are provided according to the hospital's needs and are periodically monitored and reviewed.
  - Having a formal agreement/contract also places the outsourced agency under legal obligations to ensure the delivery of services.
  - The outsourced agency should be hired through a tendering process, and a letter for the award of work should be issued to the agency.

- ✓ **Essential components of the contract**
  - The contract signed between the hospital authorities and the outsourced agency must cover at least the following essential components:

- ✓ **Well Defined Measurable Deliverables**
  - While engaging an outsourced agency, it is essential to ensure that the deliverables of the outsourced agency, in terms of service parameters, are clearly defined. This includes the work to be done and the verification of the deliverables.

Example of measurable deliverable of contract service.

Sl. no.	Measurable Deliverable	Type of Service
1.	Qualification and training of staff, TAT for various tests, Quality Assurance System	Laboratory investigations and diagnostics
2.	Response time for repairs	Maintenance
3.	Waste collection timings	BMW waste
4.	Cleanliness frequency and schedule, manpower requirements	Housekeeping services
5.	Manpower requirement, duty hours etc.	Security services

Penalty clause for non-performance or substandard performance

A penalty clause is defined as a provision within a contract that imposes a specific sum of money on the contracting party for a particular default. The contract/agreement with the outsourced agency must clearly define the penalty clause and outline the events or circumstances under which the penalty can be imposed. These events should be listed against the defined measurable deliverables of the contract, and the penalty should be enforced in case of non-performance or substandard performance by the outsourced agency. The penalty may include a reduction in agreed payment terms, non-payment for services, or cancellation of services. Hospitals must ensure that they invoke the penalty clause in the event of non-performance or substandard performance of services. Any such event should be duly recorded, and the hospital must retain records of the same.

Release of payments

The contract/agreement signed between both parties must clearly define the payment terms. The payment terms should include:

- The cost of services
- Payment delivery mode
- Frequency of payment (e.g., monthly, quarterly, annually)
- Breakdown of costs and submission of invoices for services provided

- Timeline for releasing payments after receiving undisputed invoices
- Details of other charges to be paid by the client in respect of the services.

Performance evaluation of outsourced services

The services provided by the outsourced agency should be monitored by a nominated officer from the hospital. For poor-quality services, a suitable intimation should be sent, clearly outlining the deficiencies. Suitable actions and penalties should also be imposed for improvement. The performance of the outsourced services can be measured against:

- Measurable deliverables listed in the contract
- Timeliness and promptness of services rendered
- Quality of services
- Communication and satisfaction parameters

Hospitals must ensure that they perform evaluations of outsourced agencies, and all records of the evaluations should be kept for proving compliance.

Hygiene promotion

1. Community monitoring and patient participation
2. Information education and communication
3. Leadership and teamwork
4. Training, capacity building, and standardization
5. Staff hygiene and dress code

Hygiene promotion is a planned and systematic approach to preventing diseases and promoting health through the widespread adoption of safe hygienic practices. Healthcare facilities, as integral parts of society and medical organizations, provide ample opportunities for healthcare workers to interact with different sections of society, including patients, their attendants, and visitors. Therefore, health facilities are well-suited for hygiene promotion and can play a pivotal role in improving overall hygiene.

Improving access to safe water and sanitation facilities leads to healthier families and communities. However, when people are also motivated to practice good hygiene, the health benefits to the community are significantly increased. This can be achieved through hand washing practices, cleaning routines, safe waste disposal methods, and other hygiene and sanitation measures. The goal of hygiene promotion is to help people understand and develop good hygiene practices to prevent diseases and promote positive attitudes toward cleanliness.
Several community development activities can support this goal, including:

- ✓ Education and learning programs
- ✓ Encouraging community management of environmental health facilities
- ✓ Social mobilization and organization

Hygiene promotion is not just about providing information; it involves engaging in a dialogue with communities about hygiene-related health issues to encourage improved practices. This section of the guidelines discusses different methods that can be adopted for hygiene promotion both in the community and within the healthcare facility.

Community monitoring and patient participation

Community participation is essential for empowering people to maintain and promote cleanliness and hygiene in society. Active engagement of citizens and social partners results in increased awareness, mobilization of resources, better outcomes, and a more holistic approach to hygiene and cleanliness.
Community involvement in monitoring facility cleanliness enhances accountability and fosters a sense of ownership. Participation from various sections of society empowers individuals and encourages responsibility for maintaining healthcare facility hygiene. Similarly, patient participation in promoting hygiene and cleanliness within the facility allows individuals to contribute to overall healthcare facility hygiene and sanitation.

Involvement of local governance bodies in cleanliness drive

Healthcare facilities should involve HMC, LSGD Land civil society organizations to monitor activities within the facility. These local bodies should not only oversee cleanliness but also actively participate in maintaining hygiene. Collective efforts in healthcare facility hygiene promotion enhance both societal and staff accountability in sustaining cleanliness drives. It is recommended that the HMC conduct monthly cleanliness monitoring, with proper documentation maintained for compliance purposes.

Patient counseling

Healthcare facilities should ensure that patients receive proper counselling on hygiene promotion and best practices for maintaining personal and facility cleanliness. Counselling can be provided by treating doctors, staff nurses, or members of the Infection Control Committee.

Key topics for patient counseling:

- Personal hygiene
- Hand washing techniques
- Segregation and safe disposal of waste (General & BMW)
- Overall cleanliness methods and benefits

- Water sanitation and rainwater harvesting

Counselling can be conducted during regular healthcare facility rounds or through special awareness sessions.

Patient responsibility with regard to cleanliness

Healthcare facilities should establish and prominently display patient responsibilities related to healthcare facility cleanliness. These responsibilities should be included in the healthcare facility's general patient guidelines.

Suggested patient responsibilities:

- Maintain overall cleanliness within the healthcare facility
- Follow proper waste disposal methods
- Avoid littering, spitting, or spilling in open areas
- Adhere to handwashing instructions displayed in the healthcare facility
- Provide feedback on healthcare facility cleanliness
- Limit the number of visitors and follow visiting hours
- Educate family members and attendants about healthcare facility cleanliness protocols
- Report any cleanliness-related issues to healthcare facility staff

Healthcare facilities may modify or expand these responsibilities as needed.

Feedback system for patients on hygiene and cleanliness

- Healthcare facilities should have a structured system for collecting patient and visitor feedback on healthcare facility cleanliness.

Methods for obtaining feedback:

- Structured feedback forms
- Suggestion and complaint boxes at prominent locations
- Feedback registers for complaints and suggestions

Healthcare facilities should analyze patient feedback and implement corrective actions. All records related to feedback should be maintained for compliance purposes.

Information, education, and communication (IEC)

IEC (Information, Education, and Communication) strategies enable individuals, families, and communities to actively participate in promoting and sustaining hygiene. IEC involves sharing information in culturally appropriate ways using effective communication channels and messaging techniques.

Key benefits of IEC activities:

- ✓ Increase awareness about hygiene
- ✓ Educate people about proper hygiene practices
- ✓ Motivate behavioral change
- ✓ Promote social awareness and community engagement
- ✓ Healthcare facilities should use a range of IEC materials and strategies, including:

Printed Materials:

- Brochures
- Posters
- Wall calendars

Mass Media:

- Billboards
- Advertisements
- Desktop flipcharts
- Television, radio, and DVDs/VCDs
- Public service announcements
- Print media (newspapers, magazines)
- Educational content on healthcare facility stationery and medicine dispensing covers

Healthcare facilities should ensure IEC materials are bilingual, with a preference for the local language.

General Instructions while Planning IEC Materials:

- Do not clutter too many messages at one place
- Use simple local idioms so that the messages are readily accepted by the community

- IEC materials should preferably be in pictorial form
- Display at places visited by the maximum number of patients and visitors like registration counter, waiting area, near entrance, and corridors
- Display at appropriate height; preferably at eye-level
- There should be adequate space between two posters/displays

Healthcare facilities should prepare and display IEC materials related to the following:

1. Hand Hygiene: Handwashing instructions and posters should be displayed at all handwashing stations.
2. Swachhata Abhiyan: IEC materials should include the aims and objectives of SBA, healthcare facility initiatives, community awareness materials, waste segregation and management posters, and patient responsibilities regarding cleanliness.
3. Use of Toilets: Educational posters on proper toilet usage and eliminating open defecation should be displayed inside toilets.
4. Water Sanitation: Posters and materials on water conservation, rainwater harvesting, chlorination, safe sanitation practices, and prevention of waterborne diseases should be displayed.

Healthcare facilities can adopt IEC materials from the Ministry of Health and Family Welfare (MoHFW) and the Ministry of Drinking Water and Sanitation websites.

IEC Corner in hospitals

Community participation initiatives

To encourage public engagement in hygiene promotion, healthcare facilities can organize various events such as:

- Day celebrations
- Walk-a-thons
- Bike-a-thons
- Street Plays
- Rallies

Innovative methods for hygiene promotion

Healthcare facilities should leverage innovative means to spread hygiene awareness, such as:

- Social networking groups
- Social media campaigns
- Email newsletters
- Puzzles and quizzes
- Swachhata kiosks
- Leaflets and brochures

- IEC corners run by volunteers

Leadership and teamwork

It Initiative aims to ensure clean environments in public healthcare facilities to prevent infections and enhance patient experience. Strong leadership and teamwork are essential for achieving these goals.

The Medical Superintendent, along with the administration team, should provide leadership and motivation to healthcare facility staff. Active involvement of all healthcare facility personnel is crucial to fulfilling the objectives of SBA and Kayakalp.

Cleanliness and infection control committee

- Hospital needs to form an Infection Control Committee at the facility level to implement, monitor, and review the activities of cleanliness, sanitation, hygiene, and infection control within the facility.
- While forming the Committee, it is to be ensured by the hospital that it has representation from the entire category of the staff.
- Roles and responsibilities of each and every member of the Committee need to be explicitly defined, well communicated, and documented.
- Goals and objectives of the Committee shall be well defined and communicated to its members. The objectives and goals should be SMART, i.e.:
    - **S-Specific**: Targets should be objective, fact-based, and explicitly state what is intended to be done.
    - **M-Measurable**: Targets should be measurable in numbers, ratios, proportions, percentages, or other measurable indicators.
    - **A-Attainable**: Targets should be realistic, practical, and focus on real problems that evolve rather than being radically assigned.
    - **R-Reviewable**: There should be mechanisms in place to monitor progress on achieving the goals.
    - **T-Time bound**: Begin with an end in mind. Timelines to achieve the targets shall be set at the time of setting.

Review of the progress

- Periodic review is crucial for continuous improvement. Hence, it is prudent that the top management sets a system of monitoring and reviewing the progress made in the cleanliness drive and takes corrective and preventive measures for improving cleanliness, hygiene, and infection control practices.
- The review activities should be inclined towards the objectives set by the Committee.
- It is suggested that the review of the activities be carried out on a weekly basis by the top management of the hospital and that all review meetings be properly documented, with meeting records kept to prove compliance.

Reward and recognition

- Hospitals need to adopt the practice of reward and recognition for the best-performing staff and departments of the hospital in relation to cleanliness and infection control.
- Such practices provide direct motivation to the staff and establish a system of healthy competition amongst different departments and staff categories.
- Innovative methods can be used for rewarding and recognizing the departments and staff. Incentivization of departments and staff can be one of the methods, or the name and photograph of the best-performing staff can be displayed prominently for recognition.

Training, capacity building, and standardisation

Capacity building is fundamentally about improving the effectiveness of an organisation. It focuses on enhancing an organisation's ability to do new things and improve existing processes. Simply put, capacity building improves the organisation's performance and strengthens its ability to function. It typically involves training, mentoring, and other resource support for individuals and organisations.

Capacity building results in the adoption of new skills, knowledge, and systems that help sustain and expand improvements over time. Regular training sessions should be conducted to ensure that activities related to cleanliness and infection control are carried out in a standardised manner within the hospital. Standardisation helps maximise repeatability, uniformity, and safety, thereby increasing the efficiency and efficacy of services.

Minimum requirements

Training Need Assessment

The first step in implementing any training programme is identifying the training needs of all hospital staff. The training need assessment measures employees' competence in activities related to cleanliness, hygiene, and infection control.

Training needs analysis should be conducted based on the following parameters:

- **Theoretical knowledge**
- **Demonstration of methods**
- **Practical implementation**

Based on the training needs assessment, a training schedule and materials should be prepared to address competence gaps.

Training Topics

As per the "Kayakalp" Scheme, regular training sessions must be conducted to ensure standardised cleanliness and infection control practices. Some key training areas include:

- Housekeeping and cleanliness activities
- SOPs of cleaning
- Preparation of disinfectants
- Standard methods of cleaning
- Monitoring of cleanliness and housekeeping activities
- BMW Management Rules**:** Once at the time of induction and at least once a year thereafter

Infection Control:

- Hand hygiene: Hand wash and surgical hand scrub
- PPE: Use of gloves and other protective attire
- Processing of instruments and proper storage
- Housekeeping and maintaining a sterile field
- Preventing accidents and disposal of sharps
- Proper waste disposal
- Spill management

Staff hygiene and dress code

Dress Code Policy

- Hospitals should have a uniform dress code policy to maintain a professional image, ensuring that employees and visitors feel safe, confident, and comfortable.
- A distinct dress code for each staff category is preferable for easy identification by patients and visitors.
- All staff must adhere to the dress code policy within hospital premises.
- Religious beliefs of staff and visitors should be considered while drafting the dress code policy.

The dress code policy should explicitly define standards for:

- **General Appearance:** Acceptable and non-acceptable practices regarding personal hygiene, hair, nails, jewellery, tattoos, makeup, and perfume.
- **Uniform Details:** Specifications for different staff categories (both male and female), including top, lower, colour, fabric, shoes, socks, lab coats, and aprons.

Identity Cards and Name Plates

Hospitals should provide name badges or name plates to all healthcare providers as per hospital policy. These identification badges must be worn with the name and picture facing outward.

Adherence to Dress Code

Management must ensure that all staff categories—including doctors, nurses, technicians, paramedics, and Group-D staff—comply with the dress code policy. This policy applies to regular, outsourced, and contracted staff.

ANNEXURE

STANDARD OPERATING PROCEDURE (SOP)

CLEANING OF DIFFERENT AREAS OF HOSPITAL

Cleaning Method Of Different Area Of Hospital

B.1. Cleanliness of circulation area

a. Daily Routine Patient Bed Space/Room Cleaning

Cleaning of patient care areas/rooms should follow a methodical, planned format that includes the following elements:

Assessment

- ✓ Check for additional precautions (**isolation signs**) and follow the indicated precautions.
- ✓ Walk through the room to determine what needs to be replaced (e.g., toilet paper, paper towels, soap, ABHR, gloves, sharps container).
- ✓ Identify if any special materials are required; this may be done before or during the cleaning process.

Gather Supplies

- ✓ Ensure an adequate supply of clean cloths is available.
- ✓ Prepare fresh disinfectant solution according to the manufacturer's instructions.

Hand Hygiene & PPE

- ✓ Wash hands thoroughly and wear appropriate Personal Protective Equipment (PPE) before starting the cleaning process.

Cleaning Process

- ✓ Work from clean to dirty areas and from high to low surfaces in the room.
- ✓ Use fresh cloth(s) for each patient bed space:
  - If using a bucket, do not "double-dip" cloth(s).
  - Do not shake out cloth(s).
  - Change the cleaning cloth when it is no longer saturated with disinfectant or after cleaning heavily soiled areas (e.g., toilet, bedpan cleaner).
- **Start by cleaning:**
  - Doors, door handles, push plates, and touched areas of the door frame.
  - Walls (if visibly soiled).
  - Light switches and thermostats.
  - Wall-mounted items such as ABHR dispensers.
  - Fingerprints and soil from glass partitions, door panels, mirrors, and windows using a glass cleaner.
  - Privacy curtains (if visibly soiled, replace them).
- **Clean all furnishings and horizontal surfaces**, including:
  - Chairs, window sills, telephone, and over-bed tables.
  - Lift items to clean the table thoroughly.
  - Pay particular attention to high-touch surfaces.
- **Wipe equipment on walls**, including:
  - The top of suction bottles, intercoms, and blood pressure manometers.
  - IV poles.
- **Clean patient bed area:**
  - Bedrails, bed controls, and call bells.
- Clean bathroom/shower (for single rooms) – Refer to the bathroom cleaning procedure.
- Clean floors – Refer to the floor cleaning procedure.
- **Disposal**
  - ✓ Place soiled cloths in the designated container for laundering.
  - ✓ Check the sharps container and replace it when 2/3 full (Do not dust the top of a sharps container).
  - ✓ Remove soiled linen if the bag is full.

b. Procedure for Routine, Discharge/Transfer Cleaning of a Patient Bed Space/Room

Assessment

- Check for additional precautions signs and follow the precautions indicated.
- Walk through the room to determine what needs to be replaced (e.g., toilet paper, paper towels, soap, ABHR, gloves, sharps container) and whether any special materials are required.

Gather Supplies

- Ensure an adequate supply of clean cloths is available.
- Prepare fresh disinfectant solution according to the manufacturer's instructions.

Cleaning Process

- Wash hands and put on PPE.
- **Remove dirty linen:**
    - Strip the bed and discard linen into a soiled linen bag; roll sheets carefully to prevent aerosol formation.
    - Inspect bedside curtains and window treatments; if visibly soiled, clean or change them.
    - Remove gloves and clean hands.

Clean the room, working from clean to dirty and high to low areas.

- Follow a systematic cleaning approach similar to daily cleaning, paying extra attention to high-touch surfaces.
- Clean the bed thoroughly:
    - Clean the top and sides of the mattress, turn it over and clean the underside.
    - Clean exposed bed springs and frame.
    - Check for cracks or holes in the mattress and replace if required.
    - Inspect for pest control.
    - Clean the headboard, footboard, bed rails, call bell, and bed controls.
    - Clean all lower parts of the bed frame, including castors.
    - Allow the mattress to dry.
- Clean the bathroom/shower (see bathroom cleaning procedure).
- Clean floors (see floor cleaning procedure).

Disposal

1. Follow proper waste disposal protocols, including color-coded bins as per the New BMW Rules.
2. Remove gloves and clean hands with ABHR.
3. Remake the bed and replenish supplies as required.
4. Return cleaned equipment (e.g., IV poles, pumps, walkers, commodes) to the clean storage area.

B.2. Cleanliness of Wards:

1. **Daily Cleaning Tasks:**
    - Damp dust the bed frames, railings, IV stands, lockers, etc. with the prescribed disinfectant (Name the disinfectant).
    - Floor cleaning should be done three times a day, moving from clean areas to unclean areas.
2. **Bed Maintenance:**
    - Cover mattresses and pillows with waterproof covers.
    - Use disposable plastic sheets or mackintosh to protect bed linen.
3. **Disinfection and Fumigation:**
    - Disinfect the unit with the prescribed disinfectant after the discharge or death of a patient.
    - Fumigate the room after the transfer, discharge, or death of an infected patient using Super Shine.

B.3. Cleaning of procedural areas:

Treatment Room Cleaning Process:

- Vessels used for medicine preparation for treatment procedures are cleaned in the pot washing area with cleansing agent and water.

Cleaning of panchakarma theatres:

1. Daily sanitation of the Panchakarma Theatre shall be carried out using a 1% sodium hypochlorite solution.
2. Doors shall be fitted with foot-operated door openers wherever possible to minimize hand contact.
3. Thermal screening of every individual shall be conducted at the gate. Only those cleared through screening will be allowed entry into the hospital premises.
4. Proper ventilation and airflow must be ensured in all workplace areas.
5. The floor of the Panchakarma theatre and therapy table (Droni) shall be cleaned with liquid soap after every therapy session.

6. Door knobs, handles, and other high-touch surfaces in common areas shall be cleaned frequently.
7. Dhupana Karma (medicated fumigation) shall be performed regularly using Aparajita or Dasanga Dhupa Choornam, etc.

Cleaning operating rooms

First Cleaning of the Day (Before Cases Begin)

- Wear a clean gown, cap, mask, and clean utility gloves.
- Ensure the OT is cleaned before the surgeon/anesthetist enters.
- Clean all horizontal surfaces by wet wiping with an HLD.
- Follow the top-to-bottom, inside-to-outside cleaning sequence.
- Keep the OT closed for 10-15 minutes with ventilation equipment on after cleaning.

Cleaning Between Cases

- Keep ventilation equipment on and OT doors closed.
- Wear OT dress, footwear, and a cap.
- Use fresh disinfectant solution and follow a systematic cleaning approach.
- Clean and disinfect surfaces, equipment, and floors within the OT table perimeter.

Terminal Cleaning of Operating Rooms

- Place cautionary 'Wet Floor' signs at the entrance.
- Follow the structured cleaning protocol including all high-touch surfaces and equipment.
- Mop floors ensuring disinfectant remains wet for five minutes.
- Report any needed repairs and store cleaning equipment properly.

Detailed Wash-down of the OT Complex

- Conduct weekly for frequently used OTs and monthly for less-used OTs.
- Shift all movable equipment out of the OT before cleaning.
- Follow a thorough step-by-step cleaning process including ceiling, walls, floors, and equipment.

Cleaning and Disinfection of New OT & Post Civil Work

- Ensure all civil work is completed before cleaning begins.
- Follow a meticulous three-day cleaning and sampling protocol before reopening the OT.

Cleaning and Disinfecting Environmental Surfaces and general items :

- Clean surfaces (e.g., floors, tabletops) on a regular basis, when spills occur, and when these surfaces are visibly soiled.
- Clean walls, blinds, and window curtains in patient-care areas when these surfaces are visibly contaminated or soiled.
- Decontaminate mop heads and cleaning cloths regularly to prevent contamination (e.g., launder and dry at least daily).
- Detergent and water are adequate for cleaning surfaces in non patient-care areas (e.g., administrative offices).
- Do not use high-level disinfectants/liquid chemical sterilant for disinfection of non- critical surfaces.
- Wet-dust horizontal surfaces regularly (e.g., daily, three times per week) using damp clothes.

B.4. Cleaning of ambulatory area:

Cleaning and disinfection of outpatient department

- Use phenol or grass oil for floor mopping.
- Wipe all the table tops, examination table, dressing trolleys with 1% sodium hypochlorite solution
- Change all curtains once in a week.
- Change linen on examination table every day or as and when required.
- Cleaning and disinfection of outpatient department
- Use phenol or grass oil for floor mopping.
- Wipe all the table tops, examination table, dressing trolleys with 1% sodium hypochlorite solution
- Change all curtains once in a week.
- Change linen on examination table every day or as and when required.
- Remove trash from dustbins and change the trash liner every evening before closing hours.
- The offices shall be dry dusted and swept after the closing hours.

Cleaning and disinfection of inpatient wards

- The cleaning of a patient wards will be performed once during each shift.
- Housekeeping staff with emphasis on patient touch areas such as bed, bed rails, door knobs, handles, monitoring equipment, buttons/controls, and cables.
- Soiled linen is removed by Housekeeping Staff.
- Clean the bed surface including under the mattress with disinfectant.
- Toilet, bathrooms, sinks, should be cleaned twice in day or as and when required.

Routine cleaning of floors
Mopping Floors using Dust Control Mop (Microfiber)
Procedure:

- Work from clean areas to dirty areas.
- Remove debris from the floor and dry any wet spots with old newspaper.
- Remove gum or other sticky residue from the floor.
- Starting in the farthest corner of the room, drag the mop toward you, then push it away, working in straight, slightly overlapping lines while keeping the mop head in full contact with the floor.
- Do not lift the dust mop off the floor once you have started. Use a swivel motion of the frame and wrist to change direction.
- Move furniture and replace it after dust mopping, including under and behind the bed.
- Carefully dispose of debris, ensuring not to stir up dust.
- Replace the mop head/pad when soiled and after mopping a room.

Mopping Floors using Wet Loop Mop and Bucket
Procedure:

- Work from clean areas to dirty areas.
- Prepare a fresh cleaning solution according to the manufacturer's instructions and wear appropriate PPE as per MSDS.
- Place a 'wet floor' caution sign outside the room or area being mopped.
- Divide the area into sections (e.g., corridors may be divided into two halves lengthwise so that one side is available for traffic movement while the other is being cleaned).
- Immerse the mop in the cleaning solution and wring it out.
- Push the mop around skirtings 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 the mop head over every five or six strokes.
- 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 while keeping the mop head in full contact with the floor.
- Repeat until the entire floor is cleaned.
- Change the mop head when heavily soiled or at the end of the day.

Cleaning of Toilets

- All toilets should be cleaned at least thrice a day, especially the ones in general areas.
- Cleaning equipment for toilets (i.e., floor mops, hand mops, buckets, bottles used to prepare disinfectant dilutions) should be separate and not be used in other areas of the hospital.
- Use the following method to clean toilets:
    1. Prepare all cleaning materials first. Ensure mops and buckets are clean.
    2. Wear utility gloves, a waterproof apron, and protective goggles.
    3. Wash the basin and tap with soap and water, then rinse with plain water.
    4. Clean any buckets and tumblers in the toilet.
    5. Clean the toilet fixtures and pans using soap and a brush. Brush walls up to waist height each time and at higher levels if soiling is seen.

6. Rinse away the soap by spraying water under pressure. A piece of tubing can be fixed to the tap in the toilet, and water can be sprayed through it with pressure by partially closing the outlet opening of the tube with a finger. A car sprayer attachment should be obtained if possible.
7. Brush any remaining stains and soiled areas using more soap and water, applying pressure.
8. Drain away excess water on the floor using a rubber floor wiper.
9. Sprinkle chlorine solution containing at least 5000 ppm chlorine on all surfaces except metal ones (e.g., taps). This can be prepared by making a 10% dilution by volume of a hypochlorite solution containing a minimum of 5% chlorine or by dissolving chlorine powder in water in the proportion recommended by the manufacturer to provide this strength of chlorine.
10. Allow surfaces to dry naturally.
11. Wash the cleaning equipment with soap and water and store it in the correct place.
12. Wash the utility gloves with soap and water and hang them to dry.
13. Wash hands with soap and water and disinfect them using an alcohol hand rub before proceeding to other work.

Cleaning of isolation wards/rooms

- Cleaning of this area should preferably be done after cleaning other areas.
- 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 a plastic bag first.
- Prepare all cleaning equipment and chemicals before starting cleaning. All cleaning should be completed in one session. Use an HLD.
- Wear cap, mask, gown, and rubber gloves.
- Enter the area. Keep the door closed to prevent traffic. If the patient has a respiratory infection, keep windows open.
- Clean blood and body fluid spills first.
- 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 handled carefully to prevent dropping the container. Segregate any waste at the source by putting it into the appropriate container. Waste bags should be closed, tied, and labeled before transport.
- Change gloves and begin cleaning.
- First, clean and disinfect all patient care items dedicated to the area, e.g., thermometers, blood pressure apparatus, tongue depressors, weighing scales, ambu bags, and sterile containers placed in the area. Do not take these to another location or use them on another patient before they are cleaned and disinfected properly.
- Begin cleaning the environment after this. General direction for cleaning – from clean to dirty and from top to bottom.
- Begin cleaning from the periphery of the area, e.g., clean doors, door handles, windows, and walls first. Clean walls from top to bottom. Clean all wall-mounted items (switches, hand rub bottles, etc.). Wall cleaning may be done on alternate days unless soiling is frequent.
- Next, clean all floor-based items – lockers, chairs, IV stands, waste bins, etc. Pay particular attention to high-touch surfaces like handles and bedrails. Make sure all horizontal surfaces are cleaned.
- Clean the bed last.
- Clean any attached toilets next.
- Lastly, clean the floor.
- 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 areas.
- Disposable cap and masks should be removed immediately and discarded in the correct biomedical waste container. The linen gown should be removed without touching the outer side and bagged as soiled linen.
- Wash and remove the utility gloves; wash hands with soap and water; disinfect them using an alcohol hand rub.
- If any items are to be replaced in the area, do it now. Wear fresh PPE before entering the area.

- Disinfect footwear by immersion in a chlorine solution with 500-1000 ppm 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:

- 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.
- 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.
- Clean hands and use an alcohol hand rub.
- Put on utility gloves. Wear a cap, mask, and gown if patients were on isolation precautions.
- 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.
- 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 handled carefully to prevent dropping the container. Segregate any waste at the source by putting it into the appropriate container. Waste bags should be closed, tied, and labeled before transport.
- Clean any spills of blood/body fluid first.
- Change gloves and begin terminal cleaning. Use a disinfectant. Use the pour-wipe technique. Do not use plain water or only soap and water.
- General direction for cleaning – from clean to dirty and from top to bottom.
- Begin cleaning from the periphery of the area, e.g., clean doors, door handles, windows, and walls first. Clean walls from top to bottom. Clean all wall-mounted items (e.g., switches, hand rub bottles, etc.).
- Next, clean all floor-based items – beds, lockers, chairs, IV stands, waste bins, etc. Pay particular attention to high-touch surfaces like handles and bedrails. Make sure all horizontal surfaces are cleaned.
- 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. Do not take these to another location or use them on another patient before they are cleaned and disinfected properly.

Cleaning the Bed:

- Check all sides of the mattress for soiling (replace the mattress if soiled).
- Wipe the mattress with disinfectant (if there is a waterproof cover). Otherwise, soiled mattresses should be replaced. Wipe the removed mattress with plenty of disinfectant and keep it in bright sunlight until thoroughly dry. Thereafter, check whether it is usable. If not, discard the mattress.
- Clean the entire bed (i.e., frame, side rails, wheels, etc.).
- Clean any attached toilets next.
- Lastly, clean the floor.
- 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.
- Cap, masks, and gown used for infected area cleaning should be removed using proper technique and bagged as soiled linen.
- Wash and remove the utility gloves and wash hands with soap and water.
- Disinfect hands with an alcohol hand rub.
- If fogging is to be done, go to the next step; otherwise, proceed to one step after that.
- Use the same OT HLD to fog the area. In case of aldehyde-based chemicals, use double the concentration of what is used for routine OT fumigation. 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 it 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.
- When the room is cleared to enter again, replace the linen, towels, waste collection bags, and any other materials.
- Inspect the area for cleanliness and check that all replaceable items have been replenished.

Cleaning Of Equipment

Materials required: Disinfectant working solution, hand mops, utility gloves

1. Prepare and arrange all materials before beginning.
2. **Note:** Use separate mops for equipment and environmental surfaces such as floors and walls.
3. **Procedure:**
    - Wear utility gloves.
    - Fold the mop twice (to make four layers).
    - Pour the disinfectant/cleaner on the mop. The quantity should be enough to leave the wiped surface wet for two minutes after wiping (exception: soap and water should be allowed to dry as soon as possible).
    - Wipe the equipment surface by moving the mop in one direction over it with pressure. Do not go back into the wiped area.
    - Always begin cleaning at the top of the equipment and move downwards (top to bottom).
    - When moving from one piece of equipment to another, change the fold of the mop, add more disinfectant/cleaner, and proceed.
    - When all the folds of the mop are used, keep it aside for washing and continue with a new mop. Change mops when the room is changed.
    - Allow the disinfectant/cleaner to dry naturally.

Note: During equipment cleaning, do not rinse the mop in water.

Cleaning of Ambulance

- The ambulance should be cleaned daily in the morning and after every patient transport.

Morning Cleaning:

- Wipe all surfaces with a freshly prepared low-level disinfectant.
- Clean both the patient compartment and the driver's compartment.
- Check supplies and replenish if required.

After Transport of a Patient:

1. Wear utility gloves and arrange cleaning mops, disinfectant bottles, and paper.
2. Clean visible blood spills first.
3. Remove BMW (e.g., dressings, bandages, soiled linen) in an appropriate color-coded waste bag.
4. Dispose of any sharps found during cleaning in the sharps container using forceps.
5. Remove used linen/blankets for laundering.
6. Clean and disinfect/sterilize equipment used during transport.
7. Clean and disinfect the patient compartment by wet wiping with a low-level disinfectant.
8. If the vehicle is heavily contaminated, take it out of service and perform detailed cleaning by wiping all surfaces and equipment with a high-level disinfectant (HLD).
9. Restock the supplies as required.

Detailed Cleaning (In Case of Heavy Contamination):

- Park the ambulance away from common traffic areas.
- Wear utility gloves, a disposable cap, mask, and a clean linen gown (use a waterproof gown if splashing is expected).
- Remove all equipment from both compartments (driver and patient).
- Take out stretchers, trolleys, mattresses, belts, suction bottles, waste containers, kits, and boxes. Remove contents of all shelves and drawers.
- Inspect surfaces for visible blood and body fluid spills and clean them first with an HLD.
- Clean all surfaces (above the floor, including the roof) by wet wiping with an HLD. Ensure all surfaces are wiped and check for spills of blood and body fluids.
- Clean the floor last, wiping with an HLD.
- Clean all equipment by wiping with an HLD and allow it to dry before placing it back into the vehicle.

- Replenish the supplies as required.

Monthly Deep Cleaning:

- Once a month (or more frequently, depending on use), wash down the vehicle interior and equipment by wiping with a liberal amount of soap and water.
- The method is the same as detailed cleaning, except that soap and water are used first, followed by wiping with an HLD.

Cleaning Of Water Coolers

- Water cooler tanks should be kept covered at all times.
- The tank cover should fit properly with no gaps between the tank and the cover.
- The outside of the cooler, electrical cord and plugs, the tap, and the drain tray should be wet wiped daily with soap and water. Drainage should be provided for overflow of water.
- The cooler tank should be emptied and cleaned at least once in two weeks or more frequently. In general, less frequently used coolers need more frequent cleaning, as stagnation of water promotes microbial growth. In areas and at times when the water supplied appears turbid/muddy, more frequent cleaning may be required, e.g., every week.
- Empty the tank and clean it with soap and water using a brush. Rinse with plenty of water to remove all soap.
- Wipe the inner surfaces of the tank liberally with chlorine solution containing 500 ppm of chlorine (0.5% dilution of sodium hypochlorite or prepared from chlorine powder as per manufacturer recommendations). The chlorine solution should remain wet on the surface for at least 1-2 minutes.
- Rinse with plain water twice to remove the chlorine. Check the level of residual chlorine in the water before allowing consumption:
    - In coolers without an attached carbon filter/softener, the chlorine level should be 0.2 to 0.5 ppm.
    - If the cooler has these attached, the chlorine level will always be zero.

Cleaning of air conditioners (ACs)

1. Wipe the outer surface of all ACs (especially the louvers on the air outlet) with soap and water at least once a week or more frequently (daily) if easily accessible. Wiping should be done more frequently (2-3 times a week) if the area is heavily used.
2. Once a week, the dust filters in the AC should be removed, taken outside the area, and washed to remove all dust and fibres. They should be dried and then fitted back into the AC.
3. Proper drainage should be provided to drain away all condensation from the unit. Any leakage should immediately be reported and rectified urgently.
4. Regular servicing of the units should be carried out, and records maintained. During the servicing, the roller fan inside the unit should be wiped clean using an HLD.

Disinfection of Footwear

- Disinfect footwear by immersing them in a chlorine solution containing 500–1000 ppm chlorine for 5–10 minutes before reuse.
- If the footwear is soiled with blood and/or body fluids, first disinfect them with a chlorine solution, then wash them with soap and water using a brush.

LISTOFABBREVIATIONS

1	ABHR	Alcohol-Based Hand Rub
2	AC	Air Conditioner
3	AERB	Atomic Energy Regulatory Board
4	AHU	Air Handling Unit
5	AIDS	Acquired Immune Deficiency Syndrome
6	AMT	Antibiotic Management Team
7	ART	Anti retroviral Therapy
8	BIS	Bureau of Indian Standards
9	BMW	Bio-Medical Waste
10	BOD	Biochemical Oxygen Demand
11	CBC	Complete Blood Count
12	CBMWTF	Common Bio-Medical Waste Treatment Facilities
13	CCTV	Closed-Circuit Television
14	CDC	Centers for Disease Control
15	CFL	Compact Fluorescent Lamp
16	CHC	Community Health Centre
17	COD	Chemical Oxygen Demand
18	CPCB	Central Pollution Control Board
19	CPWD	Central Public Works Department
20	CSSD	Central Sterile Services Department
21	DH	District Hospital
22	DNA	Deoxyrubo nucleic Acid
23	ECG	Electro cardiography
24	EDTA	Ethylene diamine tetra Acetic Acid
25	ETO	Ethylene Oxide
26	ETP	Effluent Treatment Plant
27	FDA	Food and Drug Administration
28	GI	Gastrointestinal
29	GOI	Government of India
30	HAI	Hospital Acquired Infection
31	HBV	Hepatitis B Virus
32	HCF	Healthcare Facilities
33	HCV	Hepatitis C Virus
34	HCW	Healthcare Worker
35	HDU	High Dependency Unit
36	HEPA	High Efficiency Particulate Air
37	HIV	Human Immuno deficiency Virus
38	HLD	High-level Disinfection
39	HOD	Head of Department
40	HSCH	High Strength Calcium Hypochlorite
41	HVAC	Heating, Ventilation, Conditioning System
42	ICU	Intensive Care Unit
43	IEC	Information Education and Communication

44	IV	Intravenous
45	LED	Light Emitting Diode
46	LPG	Liquefied Petroleum Gas
47	MCH	Mother and Child Health
48	mm	Millimetre
49	MO	Medical Officer
50	MSDS	Material Safety Data Sheet
51	NACO	National AIDS Control Organisation
52	NHM	National Health Mission
53	NHSRC	National Health Systems Resource Centre
54	NICU	Neo natal Intensive Care Unit
55	NQAS	National Quality Assurance Standards
56	OBS	Obstetrician
57	OPD	Out Patient Department
58	OPG	Ortho pantomography
59	OSHA	Occupational Safety and HealthAdministration
60	OT	Operation Theatre
61	PCPNDT	Pre-Conception and Pre-NatalDiagnosticTechnique
62	PHC	Primary Health Centre
63	PNG	Piped Natural Gas
64	PPE	Personal Protective Equipment
65	PVC	Polyvinyl Chloride
66	QUATS	Quaternary Ammonium Compounds
67	RKS	Rogi Kalyan Samiti
68	RNA	Ribonucleic Acid
69	RO	Reverse Osmosis
70	RSO	Radiation Safety Officer
71	SBP	Stable Bleaching Powder
72	SDH	Sub Divisional Hospital
73	SNCU	Sick New-born Care Unit
74	SOP	Standard Operating Procedure
75	SPCB	State Pollution Control Board
76	SSI	Surgical Site Infection
77	TAT	Turn Around Time
78	TB	Tuberculosis
79	TDS	Total Dissolved Solids
80	TOT	Training of Trainers
81	US	United State
82	USG	Ultra sonography
83	UV	Ultraviolet
84	WHO	World Health Organization

NATIONAL AYUSH MISSION KERALA

National AYUSH Mission, Kerala
1st Floor, Bliss Haven, Convent Road
Thiruvananthapuram, Kerala– 695035

Phone: 0471-2 474 550, Email: namkerala@gmail.com
www.nam.kerala.gov.in