Policy on Disinfection & Sterilization

POLICY:

The policy describes the disinfection & sterilization of equipment/instruments & patient - care articles used in different units of hospital.

DEFINITION & DESCRIPTION:

Disinfection:

Disinfection is used to reduce the number of microorganisms. Disinfectants should be used according to instructions at the optimum dilution. Disinfected objects should be cleaned thoroughly with warm water and detergent prior to disinfection. Sustained-action disinfectant should be used for hand hygiene by staff and for cleaning the skin and mucous membranes of patients. Hard surfaces do not require disinfectants - warm water with detergent is usually sufficient to remove all organic contamination except in the case of HIV or HBV.

Sterilization:

Sterilization means the removal of all microorganisms. Heat sterilization is the cheapest, safest, and the most effective method of sterilization. Cold sterilization should only be used on heat-sensitive items such as endoscopes. The only reliable method of cold sterilization is prolonged exposure to 2% Glutaraldehyde.

Items are checked for proper cleaning and working condition. They are then assembled in the assembly area. The Central Sterile Supply is responsible for the assembling of the instrument sets are used for patient care after they are appropriately sterilized.

PHYSICAL SEPARATION OF STERILE AND UNSTERILE AREAS

- The wrapping of packages should be done in as unsterile area and removed from sterile area so. That there can be no possibility of mixing sterile and unsterile packages.
- No sterile cupboards should be labeled conspicuously.
- The procedure of sending articles to the sterilizing room and receiving them form it should be set up so that sterile and no sterile packages can never be confused.

Types of Sterilization:

1. **Autoclave (moist heat)** - this is by far the most commonly used process and the most reliable. Moist heat penetrates and kills bacteria at temperatures lower than that required by dry heat.

   Steam penetrates best when air has been removed and the air is removed by
   (1) Mechanical means,
   (2) Downward displacement, and
   (3) Pulse pre-vacuum,

   The latter of which is now the most commonly used method. The moisture content of the steam is very important, the optimum conditions for steam sterilization occurs when the steam is saturated (relative humidity = 100%). The packs of equipment should come out of the autoclave dry, if not, then the packs cannot be considered as non-sterile.

2. **Dry heat** - dry heat sterilization is used for non-aqueous fluids, delicate instruments, hollow needles, glass, metal and waxes. It is unsuitable for rubber, plastics, combustible substances, and glycerol. Items to be sterilized should be wrapped in craft paper and aluminum foil. The oven is then heated to 160-180°C for a set period of time and then allowed to cool. The disadvantages of dry heat sterilization are

   (1) The sterilization cycle is long,

   (2) Uneven heat distribution in the oven results in a marked temperature variation.

3. **Ethylene oxide** - ethylene oxide can be used to sterilize most articles that can withstand temperatures of 50-60°C. However it must be used with extreme caution as it is extremely toxic and explosive. A long period of aeration is required to remove all traces of ethylene oxide
4. **Low pressure steam formaldehyde** - as in the case of ethylene oxide, it is a very versatile method of sterilization.

5. **Glutaraldehyde (2%)** - this is used for disinfecting endoscopes, bronchoscopes, and other fibre-optic instruments. Protective clothing must be worn which include gloves, eye goggles, masks, and impervious body covering. A well-ventilated room (with exhaust to the outside), a fume cabinet, or a closed system such as a fibre optic disinfection trolley must be used.

PROCEDURE:

Sr. No	Procedure Steps	Responsibility
1	The Nurse In charge of all respective units will sent all the items to CSSD which require the sterilization	Nursing Staff
2	All items disposable and non disposable received from all areas have to be handled appropriately by discarding them or preparing them for re-sterilization.	Nursing Staff
3	In OR- Post operatively collection of the equipments & then Cleaning with Tap water is done which is followed by liquid cidezime and Rapid solution of all the instruments	OR Scrub Nurse
4	Assessment (Counting), Preparation of the set of drums & Trays according to the surgeries is done	Nurse In charge, OR Nurse
5	Some instruments, needles, syringes, basins, trays and other precision items are to be cleaned manually whenever required.	Nursing Staffs
6	The Central Sterile Supply personnel are responsible for proper cleaning of reusable and some delicate and precision items or areas of instruments such as grooves or teeth require manual cleaning.	CSSD Technician
7	A variety of instruments to be processed must be appropriately handled. Sorting of used items is accomplished in the decontamination area prior to washing. Because many items are cleaned differently and with various cleaning agents it is easier to clean many like items, rather than a few items with varying requirements.	CSSD Technician

8	Application of the indicator on the drums and trays	OR Scrub Nurse
9	CSSD Technician receives all the items from the Non sterilization areas and also does the entry in CSSD register and mention Reference number for that equipment.	CSSD Technician
10	After sterilization Cycle CSSD technician keep all the sterilized equipments in Sterilized areas within the department	CSSD Technician
11	Items placed in the steam sterilizer must be allowed to properly dry in order to maintain their sterility. The phase of the cycle is as important as all other phases. Damp or wet packages must be considered unsterile and be reprocessed.	CSSD Technician
12	All cleaning and packing activity that is carried out in the CSSD has focus on Universal Precautions and aseptic techniques. The following dress code applies to all personnel working in the Central Sterile Supply area and should be strictly enforced.	CSSD Technician
13	Then they inform to the concern department or ward or OT complex to collect the sterile tray, drums, Instruments or equipments.	CSSD Technician
14	In order to keep instrument or linen packs sterile till the point of use they must be wrapped appropriately.	CSSD Technician

Disinfection and sterilization are essential for ensuring that medical and surgical instruments do not transmit Infectious pathogens to patients.

Patient Contact	Examples	Device Classification	Minimum Inactivation Level
Intact skin		Non-Critical	Cleaning and/or Low/Intermediate Level Disinfection
Mucous membranes or non-intact skin		Semi-Critical	High Level Disinfection
Sterile areas of the body, including blood contact		Critical	Sterilization

The approach to disinfection or sterilization is based on the classification which categorizes instruments or items into critical, semi-critical or non critical based on the intended use and the potential for risk of transmission of infection if the instrument was microbiologically contaminated before use. Table below shows the Spaulding‟s classification of medical devices.

Item/Device	Defnition/Intended use	Risk of infection	Reprocessing required	Example
Critical	Medical device which is intended to enter a normally sterile tissue or vasculature	High	Sterilization	Cardiac catheter Surgical - instrument Implants Needle
Semi critical	Devices that are intended to come in contact with mucous membrane or non- intact skin	High/Intermediate	Sterilization desirable HLD acceptable	Respiratory therapy equipment Some endoscopes Manometry probes Diaphragm fitting rings
Non critical	Devices that come in contact with intact skin	Low	Intermediate or LLD	BP cuf, stethoscope

The CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) have recommendations in both *2003 Guidelines for Environmental Infection Control in Health-Care Facilities* and the 2008 Guideline for Disinfection and Sterilization in Healthcare Facilities that state that the CDC does not support environmental disinfectant fogging. These

recommendations do not apply to newer technologies involving fogging for room decontamination (e.g., ozone mists, vaporized hydrogen peroxide) that have become available since the 2003 and 2008 recommendations were made.

1. CLEANING OF HOSPITAL SURFACES

The frequency of cleaning and disinfecting the environmental surfaces may vary according to the type of patient care area (high risk/ post-operative/ ICUs, OTs), the type of surfaces, the amount of people's movement and soiling.

The following protocol may be followed:

- The staff must be properly trained on the practices of cleaning & decontamination of hospital surfaces.
- Appropriate personal prophylactic equipments (PPE; gloves, masks, and boots) must be worn at all times and a proper log of all cleaning procedures must be maintained.
- The house keeping surfaces (floors/ table- tops/ counters) should be cleaned on a regular basis, when visibly soiled with Bacillocid.
- Cleaning may be done with Bacillocid and Bacillor spray for housekeeping surfaces.
- Use of sodium hypochlorite 4% disinfectant is advocated in specific high risk areas or when there is suspected spills of blood/ body substances/ MDR organisms).
- Do not use disinfectants in offices.

- High level disinfectants must not be used for environmental surfaces in any area of the hospital.
- Prepare fresh detergent/disinfectant solutions every day, according to manufacturer's instructions and replace with fresh solution frequently. .
- Follow the manufacturer's instructions for use of disinfectants, its storage and disposal.
- Diluted disinfectants may become contaminated with resistant pathogen, therefore, avoid application of contaminated cleaning solution from spray bottles/equipments which generate aerosols.
- Discard the remaining solutions after day's use and dry the containers.
- Avoid dry mopping with brooms, which generate dust aerosols.
- Ensure thorough physical wiping and scrubbing which is as effective as the use of disinfectant in reducing the bio-burden.
- Wet dust horizontal surfaces daily with a clean cloth moistened with Bacillocid
- Minimize contamination of cleaning solution and cleaning tools.
- For wet mopping, use a two bucket system. When a single bucket is used, change the solutions more frequently. Discard used cleaning solutions in the sluice. Clean the buckets with detergent and warm water and store inverted to assist drying.
- Worn and damaged cleaning equipment should be replaced. Change mop heads after cleaning spills and at the beginning of the day. Decontaminate mop head and cleaning cloths regularly to prevent contamination.

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- Clean the walls, blinds and window curtains when they are visibly contaminated or soiled. Curtains in the vicinity of a disperser of epidemic MRSA strain may be changed if the area is to be re occupied by a susceptible person within 24 hours.
- Clean and disinfect high touch surfaces more frequently than minimal touch surfaces.
- Appropriate barrier protective coverings may be used for difficult to clean high touch non critical equipment surfaces that are likely to become contaminated with blood or body fluids
- Surfaces should be left dry after cleaning.
- Disinfectant fogging is not recommended for routine patient care areas. Fogging is done in critical care areas as per defined time frame ICU's – 30 days, OT – daily, Cath lab – Daily, CSSD, Endoscopy room, CSSD once in three months.(Carbonization is done on daily basis)

  Note: ICU's Fogging may vary depending upon the occupancy regular high level cleaning is ensured.

2. CLEANING OF SPECIAL CARE AREAS

- Housekeeping areas in high risk wards need special attention for routine cleaning.
- Wet dust horizontal surfaces daily with clean cloths moistened with freshly prepared Bacillocid 1 %

- Avoid use of cleaning equipments that produce mist or aerosols or produce dispersion of dust.
- Ensure regular cleaning and maintenance of equipment to ensure efcient particle removal.
- Keep the doors closed when near -by areas are being cleaned.
- Filters in cleaning equipment/air handling unit should be cleaned and replaced as per the
- Manufacturers recommendations

3. DISINFECTION IN HEMODIALYSIS UNIT

General Recommendations in the Dialysis Unit

Universal Precautions are to be followed every time, everywhere and by everyone. Do not share clamps, scissors, and other non-disposable items unless sterilized or disinfected between patients.

Separate clean and contaminated areas; for example, handling and storage of medications and hand washing should not be done in the same or adjacent areas to that where blood samples or used equipment are handled.

Disposable gloves should be worn by staff members for their own protection when handling patients or dialysis equipment and accessories. Gloves should be worn when taking blood pressure, infecting saline or heparin, or touching dialysis machine knobs to adjust flow rates. For

the patient's protection, the staff member should use a fresh pair of gloves with each patient to prevent cross-contamination. Gloves also should be used when handling blood specimens. Staff members should wash their hands after each patient contact. Avoid touching surfaces with gloved hands that will subsequently be touched with ungloved hands before being disinfected.

Staff members are advised to wear protective eyeglasses and masks for procedures in which spurting or spattering of blood may occur, such as cleaning of dialyzers.

Staff members should wear gowns, scrub suits, or the equivalent while working in the unit and should change out of this clothing at the end of each day.

Staff members should not smoke, eats, or drink in the dialysis area.

HAEMODIALYSIS STEPS

I. Dialysis Machine cleaned.

- Internal pathways are decontaminated with disinfectant Citrosteril / Bleech / Heat
  - External Surfaces cleaned with Bacillocid 1 %
  - Bed-side, chair, table, dialysis tray, BP instrument, Stethoscope wiped with 70% Isopropyl alcohol. Bed sheet and pillow – cover shall be changed after each use.

II. Patient is called from waiting area. Weight, BP, PR, brief physical examination is done and the ultra filtration to be done is decided.

III. Dialyzer with attached tubing's are brought from Storage area and fitted into the machine. Dialyzer and tubing are primed (flushed) with 2 liters of Normal Saline to wash off any renaline residue.

IV. Vascular access (AV fistula or dialysis catheter is examined).

AV Fistula : Skin cleaned by Chlorhexidine with alcohol (AHD 3000). Dialysis catheter site examined and cleaned and dressed. A new sterile glove is used to puncture fistula or catheter connection. Fistula punctured by two fistula needles (G-16). Tubings attached to both needles and circuit is completed.

After completion of dialysis, (usually 4 hours) arterial line connection is stopped and blood in extracorporeal circuit returned through venous port into the body.

AV Fistula: Both AV Fistula needles removed and punctured sites pressed for 10-15 minutes. After achieving haemostatic, sure seal / tourniquet is applied at puncture sites.

Dialysis Catheter: Dialysis catheter ports are cleaned with Chlorhexidine with alcohol

(AHD 3000). Both limbs are flushed with heparin (1ml = 1000 IU), 1.2ml in arterial line, & 1.4ml in venous line to prevent catheter thrombosis.

Dialysis Catheter: Both exit site and catheter ports are cleaned with Chlorhexidine with alcohol (AHD 3000) Catheter exit site is dressed with Betadine.

- Flow checked in both ports.

- Ports caps put in a sterile Dialysis Kit taken from autoclaved dialysis tray.
- Both catheters ports are attached to the tubing. Heparin is infused according to physician advice to patient's condition and given as bolus followed by continuous infusion for first four hours of dialysis.

V. Informed consent is taken by the phsyciain from the patient / attainder walking in for the first time and which is valid for 30 days.

VI. BP, PR and temperature is checked before starting H.D.

BP, PR are checked at every 30 min interval.

VII. Blood Glucose – is checked as and when required for the patient.

Patient checks up his / her weight and gets it recorded.

FOR EVERY NEW PATIENT:

***** Check Serology Status

HBsAg CMIA

Anti HCV CMIA

HIV – I & II CMIA

In case of emergency, Rapid tests for first three must be done.

3.1 REPROCESSING OF DIALYZER

STEPS :

1. After disconnection, dialyzer and tubings are separated.
   Tubing should be disconnected and dialyzer taken for washing over in a leak L proof container.

2. Dialyzer has two compartments – Blood compartment and dialysate compartment. Each compartment has two ports, one for inlet and other for outlet. Each port (total – 4 such ports) is connected to automated dialyzer reprocessing system.
3. Both compartments rinsed with R0 water till effluent is clear. Any clots in dialyzer header are removed. Cleaning is further facilitated by reverse ultra filtration from the dialysate to the blood compartment. (One dialysate port is connected to water source and other dialysate port is capped). Reverse ultra filtration is continued until the effluent from the blood compartment is clear.
4. Both compartments are filled with Renalin. There after both compartments again rinsed with RO water and any residual disinfectant removed.
5. Now priming volume (Fibre bundle volume (FBV) is measured by displacing water in blood compartment with air (if FBV is <60% the dialyzer is discarded.
6. Now both compartments are filed with Renalin. Ends are clamped. All ports are capped and dialyzer is stored in a Clean Disinfected Boxes.

PREVENTION OF HCV /HIV/HBs Ag TRANSMISSION IN HEALTHCARE SETUP

1) **Surface cleaning** of equipment and surrounding surfaces which are frequently touched with Bacillol using a gauge piece before starting the procedure.
2) **Wear gloves**. Gloves are required whenever caring for a patient or touching the patient's equipment. To facilitate glove use, a supply of clean Non sterile gloves and a glove discard container should be placed near each dialysis station.
3) **Hand washing** is to be practiced meticulously. Hands always should be washed after gloves are removed and between patient contacts, as well as after touching blood, body fluids, secretions, excretions, and contaminated items. If hands are not visibly soiled, use of a waterless antiseptic hand rub can be substituted for hand washing.
4) **Take only what is required for patient.** Any item taken to a patient's dialysis station could become contaminated with blood and other body fluids and serve as a vehicle of transmission to other patients either directly or by contamination of the hands of personnel Therefore, items taken to a patient's dialysis station, including those placed on top of dialysis machines, should either be disposed of, dedicated for use only on a single patient. Unused medications or supplies (e.g., syringes, alcohol swabs) taken to the patient's station should not be returned to a common clean area or used on other patients
5) **Dedicated technician**, One technician must take care of the patient and should not move till the dialysis over for that patient. Same technician must not take care of any other patient at the same time.
6) Additional measures to prevent contamination of clean or sterile items include
   a) Preparing medications in a room or area separated from the patient treatment area and designated only for medications;
   b) Not handling or storing contaminated (i.e., used) supplies, equipment, blood samples, or biohazard containers in areas where medications and clean (i.e.,

unused) equipment and supplies are handled; and

c) Delivering medications separately to each patient.

Common carts **should not** be used within the patient treatment area to prepare or distribute medications.

If trays are used to distribute medications, clean them before using for a different patient

7. Intravenous medication vials labeled for single use, including erythropoetin, should not be punctured more than once. Once a needle has entered a vial labeled for single use, the sterility of the product can no longer be guaranteed. Residual medication from two or more vials should not be pooled into a single vial.

8. Clean and disinfect the dialysis station (e.g., chairs, beds, tables, machines) between patients. Give special attention to cleaning control panels on the dialysis machines and other surfaces that are frequently touched and potentially contaminated with patients' blood.

9. Discard all fluid and clean and disinfect all surfaces and containers associated with the prime waste (including buckets attached to the machines).

10. Between uses of medical equipment (e.g., scissors, hemostats, clamps, stethoscopes clean and apply a hospital disinfectant (i.e. alcohol rubs) if the item is visibly contaminated with blood, use cleaning and washing process.

EIGHT TIPS TO PREVENT HIV/HBsG /HCV TRANSMISSION

1) Wash hands
2) Wear gloves
3) Clean all contact areas in between patients.
4) Take to patient what is required only.

5) Give care to one patient only at a time.
6) No sharing of items between patients.
7) Reusable items take in washed clean tray every time.
8) Disinfect all reusable items.

4. PROCEDURE FOR PREVENTION OF NOSOCOMIAL INFECTION IN O.T.

Following steps must be ensured to prevent Nosocomial infection in the OT:

1. Restricted entry of personnel. Only the concerned people must be allowed to work area. Prior permission must be obtained from Sister in charge /DMS if visitors are to enter OT.
2. Only personnel in OT dress cap and mask to be allowed inside sterile zone.
3. Slippers must be ear marked and used for the area. The slippers for bathroom must be marked (Do not use same slippers for both areas).
4. No person must go with OT dress and come back into OT in the same dress. Dress must be changed if person re-enters.
5. Half an hour must be given between cases to clean up the room after each surgery.
6. Terminal cleaning must be done of each theatre at the end of the day.
7. Sister who is assisting must ensure proper disposal of sharps, blood stain, linen, gauge pieces and body parts are done at the end of each case.
8. During surgery, sister assisting must ensure that minimal spillage of blood, body fluids occur. The gauge pieces must be accounted for in the stand for gauge counting.

9. Weekend cleaning and mechanical scrubbing of the OT must be done. No elective cases must be posted on Sunday.
10. One senior sister must supervise the weekly cleaning and scrubbing as per the "critical care room cleaning guidelines".

4.1 OT CLEANING & CARBOLISATION

The OT complex should be absolutely clean at all times. Dust should not accumulate on any part of the OT. Soap solution is recommended for cleaning floors and other surfaces. Operating rooms (ORs) should be cleaned daily and the entire OT complex cleaned thoroughly once a week

Before the start of the first case : Wipe all furniture, equipment, room lights, suction points, OR table, surgical light reflectors, other light fittings, slabs with 1 percent bacillocid solution. This should be completed at least one hour before the surgery.

After each case

a. Linen: Gather all soiled linen and towels that are blood-stained, pack in a leakproof bag or closed bin, and transport to laundry suite for wash. Other linen should also be transported to the laundry suite. Appropriate PPE should be used while handling soiled linen. Disposable drapes should be disposed of in the Biomedical Red bag.

b. Instruments: Used instruments should be cleaned immediately by the scrub nurse and the attender. All the instruments should first be decontaminated in 1 percent sodium hypochlorite solution for 20 minutes and then soaked in a multienzyme cleaner for 30 minutes followed by scrubbing with a brush using liquid soap in warm water and then dried. They should then be sent for sterilization to CSSD after packing.

c. Environment: Wipe used equipment, furniture, OR table with detergent and water. If there is a blood spill, disinfect with sodium hypochlorite before wiping. Empty and clean suction bottles and tubing with disinfectant.

AFTER THE LAST CASE

The same procedure as mentioned above should be followed. In addition, the following should be carried out:

a. Wipe overhead lights, cabinets, waste receptacles, equipment, and furniture with a detergent.

b. Wash floor and wet mop with liquid soap and then remove water, and wet mop with a disinfectant solution.

c. Clean the storage shelves, scrub and clean sluice room.

Surface cleaning in OT

a.Surface Cleaning: All surfaces in OT have to be cleaned with 1 % percent bacillocid thoroughly in between cases.

b. Biohazard : (Infected cases) Cleaning: After biohazard or infected cases, all surfaces must be cleaned with 4% Hypochloride solution.

c. Followed by fogging with Echo shield

Weekend cleaning

1. Mop the room thoroughly.
2. Wash floors, walls, ceilings with clean warm soap water. Let it dry.
3. Make proper concentration solution of water with cleaning agent (E.g. Bacillocid). Read manufacturer's instructions on how to make the solution.
4. Use hard brush (not a mop) to scrub floors, walls ceilings etc thoroughly, mechanically, effectively.
5. Clean beds, furniture with soft cloth soaked in Bacillocid solution.
6. Careful while cleaning equipments. E.g. Ventilators, monitors etc.
7. Leave room and its contents to dry for 15 to 30 minutes.
8. Carbolisation with "Bacillocid".and fogging with Ecoshield Wait for 2 hours before using the facility.
9. Fumigation is outdated and should not be done. Thorough 1 to 8 steps mentioned above means proper disinfection.
10. A new washed mop and a fresh chemical solution will be used for the next OT.

5. PROTOCOL FOR MORTUARY (BODY HOLDING AREA) CLEANING AND DISINFECTION

On duty housekeeping supervisors to monitor the following important points on daily basis:

1. All staff engaged or associated with mortuary or mortuary practice shall strictly follow Standard Precautions.
2. Every morning mortuary shall be thoroughly cleaned.
3. Everything including, walls and floors shall be disinfected (carbolized) with 4 % Sodium Hypochlorite solution.
4. Equipments, freezer shall be disinfected according to manufacturer's recommendation.
5. Bacillocid or Bacillol Spray shall be sprayed (As per manufacturer's instructions) in the morning and after every dead body has been removed.
6. Bodies to remain are covered with disposable clothes (Cozy sheets) throughout their presence in the mortuary and transport.
7. Any clothes used for known infective cases shall be disposed off in a yellow bag
8. The above process shall be repeated after each dead body has been removed.

The above process shall be repeated after each dead body has been removed.

6. PROTOCOLS FOR CLEANING OF AMBULANCES

The personnel cleaning the ambulance shall follow standard precautions all the time.

The policy is to disinfect and clean the ambulance after each patient.

The cleaning shall be done at the ER department/ hospital premises.

Specific information:

- After the patient is shifted from the ambulance to the emergency care services, the blood stained sheets and pillow covers shall be bundled into green color coded bag and sent to laundry.
- The hanger, bed, spine board & the inside walls of the ambulance and the oxygen cylinders are commonly contaminated with blood/body fluids. These shall be cleaned with disinfectant approved by the IPCC.
- In the event of blood spills, 1% sodium hypochlorite shall be used. Amount shall be approximately twice the quantity of blood and the contact period shall be 20 minutes.
- The surface cleaning of the biomedical equipments shall be done by Bacillol 25.
- All infectious waste like cotton, gauze, gloves etc contaminated with either blood or body fluids shall be discarded in the yellow color coded bags.
- The water in the humidifier shall be changed every day.
- All plastic infectious & non infectious shall be discarded in red and yellow color coded bags respectively.
- All the other surfaces which may not come directly in contact with patients shall be wet mopped using soap & Water (approved by the Infection control committee) on a daily basis.
- It shall be the responsibility of the head of the emergency to ensure compliance with the policy and maintain records of the same on a daily basis.

- It shall be the responsibility of the Infection Control Officer to oversee the process.
- If a known infective case has been shifted then post transfer cleaning protocols as mentioned above should be followed

I. **Once a patient is shifted, it shall be cleaned as per the above mentioned protocol.**
II. **If the hospital ambulance is not used, then it shall be cleaned at least once daily as per the above mentioned protocol.**
III. **A thorough cleaning shall be done once a week at least.**

7. PROTOCOL FOR CONSTRUCTION/RENOVATION WITHIN THE HOSPITAL PREMISES

To ensures timely notification to the Infection Control Committee for long range program planning efforts and short term projects.

To provide an infection control evaluation of each project from conception through completion and support a systematic approach to project management.

Procedure:

- The Maintenance Manager shall submit list of scheduled project to the Infection control Committee, enabling the committee to be proactively aware of projects and to anticipate infection control needs.
- The Maintenance Manager shall submit an application for Infection Control Construction Permit (Annexure II) to the Convener – Infection Control Committee.

- The Infection Control Construction Permit shall assist staff members in assessing risks and identifying prevention strategies. The Infection Control Construction Permit shall assess the complexity of the project as a matrix of risk groups (patients and environment).

  The matrix grid of format immediately shall identity:

  - Number and types of necessary controls and Infection Control interventions.
  - Signatures of all parties, thus providing accountability for the mutually agreed upon plan.

  The Maintenance Manager shall be responsible for establishing internal and subcontractor coordination of

  (1) construction preparation and demolition;

  (2) intra construction operations and maintenance;

  (3) project completion and post-construction cleanup;

  (4) monitoring.

- The Maintenance Manager in co-ordination with Infection Control Committee Convener shall determine if or how patient unit closure will occur.
- The Maintenance Manager shall plan for air handling and water systems/ plumbing as appropriate. The Maintenance Manager in coordination with Infection Control Committee Convener shall assess patient are risk assessment and criteria for emergency work interruptions.

- The Maintenance Manager shall impart basic education to construction workers regarding infection control practices.
- The Maintenance Manager shall convey occupational health expectations for subcontractor before start, as needed.
- The Maintenance Manager and General Manager – Operations shall determine traffic patterns for patients, health care workers, and visitors during renovation / construction.
- The Maintenance Manager shall ensure appropriate transport of debris and approval for disposal of waste materials
- The Maintenance Manager shall be prepared for major utility failures with infection control implications, including location and responsibilities.
- ICT shall conduct rounds often as necessary and include a variety of observable "indicators" such as barriers (doors, signage), air handling (windows close), project area (debris, cleaning), traffic control, and dress code.
- When an outbreak associated with construction is suspected or identified, water or air sampling shall be done.
- After the end of construction / renovation process the Infection Control Committee shall conduct rounds and give approval for opening the area for patient and employee activities.

8. CHEMICALDISINFETION

- In general, the activity of a disinfectant depends on the temperature, contact time, pH, presence of organic or inorganic matter and number and resistance of the bio- burden on a surface, therefore, while using the product, the users must comply with the manufacturer's label instructions of use-concentration, contact time, temperature, product compatibility, specific purpose of germicide, exposure hazard and methods of disposal.
- HCW must exercise due precautions and use appropriate PPE while using disinfectants.
- Use only instrument grade disinfectants for equipments and instruments.
- Pre-cleaning of instruments must be done to ensure appropriate disinfectant activity.
- An increase in pH improves the activity of some disinfectants (glutaraldehyde, quaternary ammonium compounds) but decreases the activity of others (phenols, hypochlorite, iodine). Many disinfectants require dilution prior to use.
- It is mandatory to follow the manufacturer‟s instructions exactly as per label regarding use, its dilution and mixing (higher dilution will reduce activity and high concentration can damage instruments or cause toxic efffects to the users).

9. CLEANING OF MEDICAL EQUIPMENT

- Thorough cleaning, preferably done at the point of use must precede any disinfection or sterilization process. Cleaning alone (physical scrubbing with detergents and surfactants followed by rinsing with water) efffectively removes a large number of microorganisms from contaminated equipments and surfaces. For efffective cleaning:
- The staf must be properly trained and required to wear PPE appropriate to be task.
- The manufacturers of equipment should provide instructions regarding its cleaning and disinfection, with specifiic information regarding germicide and water compatibility.
- Utmost care should be taken to prevent drying/baking of soiled material on the surface. Therefore, immediately after use, surgical equipments/soiled devices must be disassembled, rinsed or soaked in water with / without detergent to prevent drying of blood and to facilitate removal of soil and blood.
- Cleaning can be done manually. Manual cleaning is done by scrubbing/rubbing with friction using a brush and employing water under pressure. Care should be taken to remove all visible soil and to reach all channels and bores of the instruments. Items composed of more than one removable part should be disassembled and cleaned.

- Hinged instruments should be opened fully to allow adequate contact with the detergent solution, stacking of instruments should be avoided and instruments should be disassembled as much as possible.
- Delicate and intricate objects and heat- or moisture-sensitive articles may require careful cleaning by hand.
- Cleaning should be usually done using a blanisol-pur. A neutral/near neutral pH detergent solution is commonly used because such solutions generally have the best material compatibility and good soil removal. Enzymes (usually proteases) are sometimes added to assist in removing organic material. 3M Rapid Multi enzymatic cleaner must be used in accordance with manufacturer's instructions.

Disinfection of HBV, HCV, HIV or TB contaminated devices

Equipment, devices and surfaces should be managed in the same way regardless of the whether the patient is known to be infected with HBV, HCV, HIV or *M. tuberculosis*.

10. ENDOSCOPES AND BRONCHOSCOPES – USAGE AND CARE

A. ENDOSCOPES CLEANING PROCEDURE

Beginning of each list: Cleaning & disinfection shall be undertaken before the endoscopy list, between each examination and at the end of list. Specialized training & knowledge of the working of the instrument are essential for this to be done effectively.

1. **External Cleaning :**
   Totally immerse the instrument in enzymatic detergent. Wash the outside of the instrument, thoroughly with gauze swabs. Brush the distal end with a soft toothbrush, paying particular attention to the air/water outlet nozzle & bridge/elevator where fitted. All valves are removed, cleaned and disinfected. Clean Biopsy channel opening and suction port using cotton buds.

2. **Brushing through the suction biopsy channel :**
   - Introduce the cleaning brush from biopsy port through the patient tube, until it emerges from the distal end at least three times.
   - Pass the cleaning brush through the suction port and down the patient tube until it emerges from the suction connector at least three times.
   - Pass the cleaning brush from the suction port, through the umbilical cord, until it emerges from the suction connector at least three times.
3. Flushing internal channels: Flush each internal channel with detergent fluid. This shall be done independently for each separate channel.
4. Rinsing: Flush all channels are above using clean water followed by air to expel as much water as possible prior to disinfection.
5. Disinfection: Totally immerse the instrument in either 2% glutaraldehyde. Fill each internal channel with disinfectant & leave the instrument for the recommended contact time. Before and after the list this is 20 minutes and between cases 4 minutes.
6. Rinsing: Following disinfection, rinse instrument internally and externally to remove all traces of disinfectant.

7. Drying: Dry endoscope externally. Flush air through each channel. Reconnect the endoscope to the light source & fit disinfected valves. Switch on the light source & expel fluid from air/water channel by simultaneously occluding the water bottle connectors on the endoscope & depressing the air/water valve. Connect the instrument to the suction machine & dry the suction channel by depression the suction valve several times.
   - Pressured air supply can be useful & better for drying equipment.

3. In Between Patients:

Flush the air/water channel for 10-15 seconds to eject any refluxed blood or mucous. Aspirate detergent through the biopsy / suction channel for about 10-15 seconds to remove gross debris. Disconnect the instrument from light sources & disinfection for 4 minutes.

4. End of list:

Disinfection for 20 minutes. Rinse thoroughly & dry. Check equipment, store hanging, in security cupboard.

A log book is to be maintained indicating for each endoscopy done, the patient's name. ID No, procedure done, consultant using endoscopy, the time at which the endoscopy started and finished and time of putting the endoscope in disinfectant and time of taking out the endoscope from disinfectant.

B. ENDOSCOPE ACCESSORIES DISINFECTION

This equipment can be divided into 2 Groups:

1. Items forming part of the endoscope as attachments e.g., Valves, water bottles & cleaning equipment, wash pipes brushes and tooth brushes.

2. Item used during procedures & for diagnostic & therapeutic purpose, e.g. Mouth guards, biopsy forceps, cytology brushes, ERCP cannula etc.

METHOD

- Wash immediately after use in fresh detergent.
- Dismantle as far as possible.
- Brush away adherent debris with cleaning brush.
- Flush detergent solution through lumen of all hollow components.
- Ultrasonic clean – it is impossible without-this to clean sharp angulated & spiral metallic structures.

Then either disinfect or sterilize:

Disinfect - Immerse in disinfectant with lumen filled for 20 minutes.

- Rinse & Dry.

Sterilize - Ethylene oxide gas.

11. BRONCHOSCOPE

CLEANING

Clean the scope immediately after procedure...

Put on gloves on the hands.

a) Wipe with gauze/paper towel.
b) Such clean water for 10 seconds and then air, slowly, so as not to generate aerosols. Repeat it many times.
c) Remove suction valve and biopsy valve from the scope.
d) Immerse the scope completely into soap solution and scrub the external surface.
e) Clean the channel with channel cleaning brush. Dismantle both the valves and clean it thoroughly.
f) Attach suction cleaning adapter and do alternate suction of clean water and air many times.
g) Dry the scope.

CLEANING HAS TO BE FOLLOWED BY DISINFECTION

Disinfection

(a) Immerse the scope completely in 2.0% glutaraldehyde (undiluted Cidex) with syringe attached to suction cleaning adapter (withdraw the plunger until the syringe is filled with Cidex).

(b) Disconnect the suction cleaning adapter and let the scope and adapter be completely immersed in 2% glutaraldehyde (undiluted Cidex) for prescribed time.

* Minimum: 30 minutes.
* Suspected HIV: 30 minutes.
* Suspected TB: 1 hr.
* Suspected MDRTB: 24 hrs.

(c) Remove the scope from Cidex and thoroughly clean & scrub the external surface with sterile water.

(d) Reattach the suction cleaning adapter and do alternate suction of air and water.

(e) Dry the scope with sterile gauze and the channel by sucking air, for sufficient time.
(f) Attach the suction and biopsy valve, after cleaning them with sterile water.
(g) Hang the scope or keep it in trolley over sterile sheet for the next procedure.

Biopsy forceps/ cytology brushes, reusable accessories penetrating mucosal barriers shall be cleaned and then ideally steam sterilized failing which immersed in 2% glutaraldehyde, in between each patient use.

Important

- Make fresh activated Cidex every 14 days (label the date on the container).
- Make sufficient volume to completely immerse the scope.
- Note down the time of immersion and time of removal of scope from Cidex solution.
- Insist on minimum of 30 minutes immersion.
- Post disinfection and rinsing with sterile water, the equipment has to be kept dry.
- A log book shall be maintained indicating for each bronchoscopy done, the patient's name, ID No., procedure done, consultant using endoscopy, the time at which the endoscopy started and finished and time of putting the endoscope in disinfectant and time of taking out the endoscope from disinfectant.

12. REPROCESSING OF RESPIRATORY APPARATUS

A. VENTILATORS

Respiratory, anesthetic, resuscitation and similar apparatus and ventilators are classed for use in mucosal (semi critical) sites and therefore, should be sterilized when possible. If items cannot withstand sterilization, they must receive high level disinfection.

MAINTENANCE OF VENTILATORS:

The manufacturers must provide complete information regarding cleaning and decontamination, which should be followed. All reusable equipments must be cleaned and disinfected as per manufacturer's recommendations

- All equipments should be covered when not in use.
- Use appropriate PPE and respiratory protection. Perform hand hygiene after handling these equipments
- All disposable devices must be discarded between patients or more frequently if indicated.
- Select an internal filter which has high microbial and water retention property.
- Clean the ventilators to remove all organic soil.
- Preferably use disposable circuits and filters, which should be changed after every patient

- Changing or replacing ventilator circuits does not need to be performed on routine basis but it is indicated if it is malfunctions or visible soiled
- Replace the external filters and tubing, if they are visibly soiled and when needed to assure proper ventilator function.
- Place labels in a conspicuous place on the breathing circuit, noting the date and time the system was changed.
- Breathing circuits should be monitored and changed when excess of blood or mucus etc is noted in the circuit.
- While assembling the circuit, don‟t allow the circuit to dangle close to the floor.
- During use, the machine and all its parts (support arm, electric cord, high pressure hoses, alarm and wheels) should be wiped with hospital approved disinfectant when visibly soiled.
- Ventilator accessories, such as spacers for metered dose inhalers may be kept at bedside between treatments in clean plastic bags.
- Do not allow the tubing condensate to drain into patient‟s trachea or back into humidifiers.

Condensate must be periodically removed from tubing using aseptic techniques to empty the trap device.

B. Humidifers

- The humidifier should be cleaned and disinfected (70-90% alcohol) before refilling with sterile water.
- Do not add antiseptics to humidifier water. Change the entire humidifier system when indicated or empty.
- If water humidifiers are used, change circuits every 24 hours and in between patients.
- Moisture traps should be incorporated to protect fiilters.
- If heat- moisture exchangers are used, circuits may be changed weekly and in between patients.
- HME Filters can be safely used at least 48 hours in most patients and even longer(up to 7 days) with better performing devices in patients without airway secretions
- Patients who potentially require more frequent changes includes those with obstructive airway diseases, copious airway secretions or with frequent clogging with secretions

C. Nebulizers

Nebulizer chamber and mask is changed in between the patient. For the same patient the chamber shall be washed with warm water after use and dried immediately. Alternatively these shall be immersed in 70% alcohol and allowed to dry and kept dry. These are then rinsed with sterile distilled water before use

D. **Oxygen Hoods**

- Dispose oxygen hood every 48 hours and after each patient.
- Oxygen masks and tubings should be disposed.
- Replace the entire oxygen hood delivery system every 7 days.
- Piped gases do not become contaminated with bacteria, provided the lines remain dry.

E. **Bed side pulmonary screening devices**

- Discard all pulmonary screening devices (inspiratory force manometer, tidal volume/vital capacity devices and peak flow meters) after single patient use.
- Wipe all non disposable spirometers and manometers with a hospital approved disinfectant between patients.

F. **Anesthetic equipment**

- The external surface of the machine should be kept clean and dry.
- Tubings, reservoirs, ambubag, face masks, endotracheal tubes and airways, if not single use, should be cleaned and thermally disinfected and used for the same patient (preferably at the CSSD).
- Disposable face masks, tubings and reservoir bags may be given to patients sufffering from suspected tuberculosis**.**

G. **Laryngoscope blade**

Clean with detergent, followed by disinfection with 70-90% alcohol for 10 minutes and drying.

H. **Suction equipment**

After use, the contents of suction bottle shall be discarded, bottle washed and dried. The aspirates shall not be allowed to stand for long periods (not more than 4-6 hours). The aspirate is emptied into the sluice. Alternatively it is to be emptied in equal amounts of freshly prepared 1% hypochlorite and left covered for 20 minutes.

Non sterile gloves shall be worn at the time of handling such bottles. Hands are washed after removing of gloves. A fresh catheter is to be used each time a patient undergoes suction

I. Ambu-Bag

It is autoclaved. Used sterile for each patient for each use. 2% glutaraldehyde is a less acceptable alternative.

J. Oxygen Flow Meter Humidifier Container

The container must be kept dry and filled with Sterile distilled water before use only. In between patient, it is washed with detergent and water. Water must be changed every 24 hours. The container must be kept dry when not in use.

PROPOSED METHODS OF DISINFECTION OF COMMONLY USED ARTICLES / MATERIALS / SURFACES

Material	Method
Ampoules	Wipe neck with 60%-70% ethyl/isopropyl alcohol Not to be immersed in alcohol
Baths (Bathing tubs)	Wipe with chlorine releasing solution (1% Hypochlorite) and rinse with plenty of water
Bed frames (non infected patient)	Wiping with Bacillocid 1 %
Bed frames (infected patient / spillage)	Wiping with 4% Hypochlorite

Bedpans	Individual pans for each patient to be preferably given. 1% hypochlorite is used to wash. Dry before re-use.
Baby weighing scales	Clean tray as necessary with detergent and water. If gross contamination with blood or body fluids Clean with Bacillocid 1 % (or) basillol 25
Baby weighing scales (Contaminated)	Clean with 4 % Hypochlorite solution (or) basillol 25
Endoscopes	Seen guidelines for individual endoscopes
Floors , if spillage Floors terminal cleaning	As per spill policy ICU: Cleaning with Bacillocid 1% three times a day. Wards: Cleaning with Detergent & 0.05 % Bacillocid, Infected cases: Cleaning with 4% Hypochlorite solution three times a day
Furniture and fittings	Detergent (R2) solution wipe / wash
Furniture and fittings (terminal)	4% hypochlorite (or) Bacillocid 1 %
Infant incubators	Clean with detergent; dry with disposable wipes; then wipe with 1% hypochlorite (or) Bacillocid 1 % or 60-70% isopropyl/ethyl alcohol (Bacillol 25)
Mattresses	To be covered with water impermeable disposable sleeve; grossly contaminated then wash with 1% hypochlorite
Pillows	To be covered with water impermeable disposable sleeve; grossly contaminated then wash with 1%

	hypochlorite
Rooms (uninfected patients)	Wash all surfaces in detergent solutions, R2 and allow to dry
Rooms (grossly contaminated / infected patients)	Wash with detergent solution (R2) and allow drying. Wash with hypochlorite 4% or bacillocid 1% and wipe dry.
Rooms (Isolation categories)	Wash with detergent, Carbolize with Bacillocid and fogg with Echo shield; close room for 1 hour and then adequate aeration before usage.
Skin	AHD 3000
Stethoscope	Bacilloll spray 1 %
Sigmoid scope (Rigid)	Thoroughly clean Blanisol pur and autoclave
Toilet seats	Wash with sanitizer
Toys	Clean with detergent and dry if washable.
Toys (contaminated)	Cleaning with detergent and spray with Bacillol spray
Trolley tops	Clean with detergent and wipe dry
Trolley tops (contaminated)	Cleaning with detergent and spray with Bacillocid 1 %
Telephones	Wipe with Bacilloll Spray
Thermometers (oral)	Clean with detergent and water and dried ;wipe with 60-70% isopropyl alcohol or 25 - Bacilloll Spray

Vagina specula / Throat Specula	Single use instrument preferred. For re-usables, thoroughly clean and autoclave
Wheel Chairs & stretchers	Wipe & clean with detergent two time day & 1% sodium hypochlorite if soiled or contaminated.
X-ray / Ultrasonography equipment	Switched off; wipe with detergent solution with damp dusting do not over wet; allow to dry; and wipe with Bacillocid 1 %
Humidifiers	Clean with detergent, and hot water
Suction equipment	Throw the contents. Wash thoroughly with water then dip in 1%Hypochlorite .Keep for 20 min. Dry it and use it.
Ventilation Circuit (C-Circuit)	Disposable. If soiled discard it. New ones for each patient.
General floor cleaner (Non critical)	Taski R2 plus (Diversey)
Toilet bowl cleaner in General admin	Taski R6 (Diversey)
Bathroom/was cleaner in General Admin	Taski Sani Cid Con (Diversey) W1 d
Glass cleaner	Taski R3 (Diversey)
Stainless steel	D7 (Suma Inox D7.1)

Disinfectants are avoided during suction. 1% hypochlorite shall be flushed through tubing post suction in suspected highly infectious case. Tubings are changed when obviously soiled.

When not in use the bottle shall be kept dry and tubing shall be attached only when required. Disposable suction bottles are preferable especially whenever highly contagious diseases are suspected.

1% Sodium Hypochlorite – 250 ml of 4 % Hypochlorite mixed with 750 ml of distilled water for 1000 ml of 1% sodium hypochlorite

1 % of Bacillocid extra – 50 ml of Bacillocid extra in 5 liters of water (Make it 5 lit)
0.5 % of Bacillocid extra – 25 ml of bacillocid extra in 5 liters of water (Make it 5 lit)
1% - Banisol Pure – 10 ml solution in 1 Liter of water
0.5% Banisol Pure – 5 ml of solution in 1 liter of water (Make it 1 liter)
R2 - 6 ml in 1 liter matter
R3 – 20-50 ml of R3 should dilute in 1 liter of water
R9 – 15 ml of R9 dilute in 1 liter of distilled water
R6 – Ready to use
D7 – Ready to use

Endoscopy Unit

Fibre-optic endoscopes are usually heat-labile and therefore require chemical disinfection. 2% glutaraldehyde should be used to clean, sterilize, or disinfect.

Disposable Equipment:

1. **Syringes and needles** - disposable syringes and needles should be used. Under no circumstances should fine-bore needles be recycled because they cannot be cleaned. If syringes are to be recycled, it must be well controlled. After thorough cleaning, the syringes must be autoclaved or processed in ethylene oxide.
2. **Administration sets** - administration sets for IV fluids must be disposable
3. **Urinary catheters and drainage bags** - these should be single-use and disposable

Other Instruction:

RECORDS TO BE MAINTAINED IN CSSD

- ✓ Date & Time of receiving
- ✓ Name of the Trays or Drums Or Equipments
- ✓ Quantity
- ✓ Ref.No
- ✓ Type of the sterilization
- ✓ Date & Time of the sterilization (NO OF HOURS)
- ✓ Name (Received By), Date & Time of Dispatch
- ✓ Name (dispatch By), Date & Time of CSSD Technician

Prepared by:	Verified by:	Approved by:
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Infection Control Officer	Medical Director	Chief executive Officer

LABELLING

1. Name of device or pack.
2. The date of sterilization.
3. The date of expiry.
4. The method of sterilization used whether Steam, ETO or Plasma.
5. An indicator should be attached to the label.
6. Adhesive tape should be used which leaves should be written clearly by ball pen (not sketch pen, markers or pencil).
7. No residue on linen.
8. One side should be folded to ease opening.
9. Name and matter should be clear and readable.
10. No cancelling or over writing is not permitted.

FUMIGATION OF STERILE AREA

Central Sterile Supply is a housing area for sterile and clean supplies intended for patient usage. Bacteria should be controlled as much as mechanically and humanly possible by all employees who work in this area

MAINTENANCE OF STERILE STORES

To prevent or control infection to have control on living pathogens and prevent them from entering into the Sterile Areas of the body whenever accessed. It should be properly managed separately for sterile and unsterile goods. Sterile store in records should also be maintained regularly.